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23 July 1980

USSR Report

ENERGY

No. 22

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CONTENTS

ELECTRIC POWER

Goals of 1980 Energy Ministry Program Given
(ELEKTRICHESKIYE STANTSII, May 80) 1

Power Engineering: Overview of Developments
(EKONOMICHESKAYA GAZETA, Apr 80) 11

Soviet Electric Power Development Discussed
(STROITEL'NAYA GAZETA, 20 Apr 80) 13

Daugavskiy GES Cascade Considered Very Important Project
(Nikolay Fedorovich Cherepov Interview;
SOVETSKAYA LATVIYA, 15 Apr 80) 17

Kazakhstan Power Engineering History Briefly Outlined
(I. Balgayev, Ye. Balgayeva; NARODNOYE KHOZYAYSTVO
KAZAKHSTANA, No 4, 1980) 20

Future Plans Outlined in Conference
(RABOCHAYA GAZETA, 27 Apr 80) 26

Ash, Slag Removal Systems Developed for Power Plants
(L. N. Zhingel', et al.; ENERGETIK, Mar 80) 27

ENERGY CONSERVATION

Meat Industry Programs of Fuel, Energy Conservation
(V. V. Mikhov; MYASNAYA INDUSTRIYA SSSR, May 80) 32

FUELS

Ekibastuz Fuel, Energy Complex: Its Wealth, Outlook for Development
(Yu. Grin'ko, et al.; IZVESTIYA, 28 May 80) 38

Light-Weight Structural Parts Facilitate Mine Construction
(V. Radchenko; IZVESTIYA, 15 Jun 80) 44

Recovery, Utilization of Methane From Coal Mines Urged
(A. Brizhanev, N. Lisovenko; IZVESTIYA, 10 Jun 80) . 46

Plant Supplies Gas Pipeline Fittings
(I. Kalashnikov; IZVESTIYA, 4 Jun 80) 49

Gas Pipeline for Supply to Uzbek Power Station
(F. Ovechkin; PRAVDA, 16 Apr 80) 51

Road Construction for Tyumen' Oil Workers
(SOTSIALISTICHESKAYA INDUSTRIYA, 14 Jun 80) 53

Briefs

New Oil Well 56
Oil Equipment 56
Forge Coal 56

ELECTRIC POWER

GOALS OF 1980 ENERGY MINISTRY PROGRAM GIVEN

Moscow ELEKTRICHESKIYE STANTSII in Russian No 5, May 80 pp 2-4

[Article: "Socialist Obligations of Worker Collectives of Enterprises and Organizations of the USSR Ministry of Power Engineering and Electrification for 1980, the Concluding Year of the Tenth Five-Year Plan"]

[Text] The worker collectives of enterprises and organizations of the USSR Ministry of Power Engineering and Electrification (Minergo) are persistently translating into reality the decisions of the 25th CPSU Congress for a further increase in the country's energy potential. Having unfolded the socialist competition for fulfillment of the 1979 quotas, they provided the national economy with electrical and heat energy in the limits of the established plan. Produced in all was 1147.2 billion kilowatt-hours of electrical and 839.3 million Gcal of heat energy. The disposal of industrial output came to 20.1 billion rubles, including 145.9 million rubles above the plan.

New capacities were introduced at electric power plants of the ministry amounting to 10.9 million kilowatts. Brought up to full design capacity were the Nurekskaya GES for 2.7 million kilowatts and the Iriklinskaya GRES for 2.4 million kilowatts. Turbines were put into operation at the Kursk, Chernobyl' and Armenian atomic electric power plants, the second and third hydro-units for 640,000 kilowatts were put into operation at the Sayano-Shushenskaya GES, as well as others. High-capacity electric power lines were built, including the Vinnitsa-Al'bertirsha and the Kursk Atomic Power Plant-Bryansk lines.

Production capacities were introduced in the second phase of the Volgodonsk Atommash Plant for producing equipment for atomic power plants amounting to 1 million kilowatts per year, the first capacities of the Nadezhsinsk Metallurgical Plant were introduced, the Tol'yatti Plant of the Kuybyshevazot Production Association was put into operation, and others.

The General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet comrade L.I. Brezhnev gave a high evaluation of the labor of the foremost collectives in his greetings to builders, installers and operations personnel of the Nurekskaya GES, the Iriklinskaya GRES and the Armenian AES, the Orenburg Gas Refinery, the 750 kilovolt overhead line from Vinnitsa to Al'bertirsha, and the power engineers of the Kostromskaya GRES. These greetings brought forth a new flood of creative forces in all collectives of the sector.

The power engineers and power builders--responding with concrete deeds to the decisions of the November 1979 Plenum of the CPSU Central Committee, guided by the statements and conclusions set forth in the speech to the Plenum by the General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet comrade L.I. Brezhnev--have widely unfolded a socialist competition for a worthy greeting to the 110th anniversary of the birth of V.I. Lenin, for successful fulfillment of the 1980 plan and the Tenth Five-Year Plan as a whole, and they have resolved to work under the motto "We will build ahead of schedule, we will develop ahead of schedule."

Collectives of operating personnel, builders and assemblers of the Kostromskaya and Reftinskaya GRES, the Chernobyl'skaya and Kol'skaya AES have come forward with a patriotic initiative for developing socialist competition in the sector. They have taken on stepped-up counter plans and obligations for early putting into operation and mastery of capacities, for a saving of fuel and power resources, and for improvement of technico-economic indicators.

Following their patriotic example, the labor collectives of the energy sector have resolved to turn 1980 into a year of shock Leninist work. They are pledging to do the following by the 110th anniversary of the birth of V.I. Lenin:

To save owing to reduction of specific expenditures not less than 600,000 tons of standard fuel by comparison with the corresponding period of last year;

To fulfill a four-month program for sale of output amounting to 6 billion rubles;

To earn 10 million rubles of above-plan profit;

To put new power and production capacities into operation ahead of schedule, including: 103,000 and 104,000 kilowatts (hydro-units Nos. 7 and 8, respectively) at Dneproges-2, 78,000 kilowatts (hydro-unit No. 3) at the Nizhnekamskaya GES, the 110 kilovolt overhead line from Turki-NS-6 in Saratovskaya Oblast, the Nizhneangarsk-Muyakan 220-kilovolt overhead line on the Baikal-Amur Main Line, and a pilot pumping station for the Zhigulev irrigation system;

To develop:

a) the technical plans for the country's first Southern Ukraine energy complex, consisting of hydraulic, pumped-storage and nuclear electric power plants, which will make it possible to obtain an economic benefit amounting to 40 million rubles;

b) target complex programs for creation of experimental industrial solar and geothermal electric power plants.

The power engineers and builders of electrical facilities are making the following pledges for 1980.

In the Area of Operation of Electric Power Plants and Networks

Concentrate the main attention on insuring reliable and uninterrupted supply of electrical and heat energy to the national economy and the country's population, based on a further increase in the reliability and economy of operation of the equipment of electric power plants and networks, better utilization of energy capacities, reduction of the times for assimilation of new equipment, all-possible saving of fuel-energy resources, broad dissemination of the know-how of the advanced collectives, and an increase in the effect of the economic mechanism on raising the efficiency and quality of work in all units of the energy industry.

Complete in accordance with the approved schedule, with good and excellent evaluations, the plan for capital repair of basic energy equipment, and for preparation of electrical power plants and networks for operation in the fall-winter period of 1980-1981. Manufacture spare parts for energy equipment worth 600,000 rubles above the plan quota.

Reduce the downtimes of equipment in repair against the times foreseen in the plan by 0.5 percent, which will make it possible to reduce the downtime of energy blocks in capital repair by 30 days and to obtain additional production of 129 million kilowatt-hours of electric power, and to save 780,000 rubles.

Achieve in comparison with the level attained in 1979 an increase in utilization of the capacity of 500,000 and 800,000 kilowatt energy blocks by not less than 1.5 percent, which will provide additional output of electric power amounting to 1 billion kilowatt-hours.

On the basis of introduction of organizational and technical measures, and the use of the advanced know-how of the Kostromskaya, Iriklinskaya, Reftinskaya, Zaporozhskaya and Sredneural'skaya state regional electric power plants (GRES): lower the specific expenditures of fuel per released kilowatt-hour of electric power to 327 grams and insure a saving of 3 million tons of standard fuel in comparison with 1979.

It is pledged to insure early mastery of the design capacity of energy blocks:

in the third quarter at the Armyanskaya Atomic Power Plant (AES)--block No. 2 with a capacity of 410,000 kilowatts;

in December at the Novovoronezhskaya AES--block No. 5 with a capacity of 1 million kilowatts, at the Rovenskaya AES--block No. 1 with a capacity of 440,000 kilowatts, at Ekibastuzskaya GRES--blocks Nos. 1 and 2 for 500,000 kilowatts each, and the pilot steam-gas installation for 250,000 kilowatts at the Moldavian GRES.

Obtain not less than 25 million rubles of above-plan profit owing to increasing the effectiveness of energy production, and reducing the prime cost of electrical and heat energy.

Implement measures for automation and mechanization of the production of electrical and heat energy, for increasing the level of standardization, introduction of scientific organization and labor and owing to this conditionally release 6,000 industrial-production personnel.

Carry out by 22 December the measures for eliminating the gap between installed and available capacities, which will make it possible to increase by 2.4 million kilowatts the total active capacity and to produce not less than an additional 3 billion kilowatt-hours of electric power.

Convert to collective forms of labor organization (brigade method) for repair jobs not less than 40 percent of the workers in industrial-repair enterprises of the operations main administrations and Glavenergoremont.

Achieve a reduction in idle periods of railroad cars at electric power plants by 0.2 hours against the norm, which will make it possible to release over 4,000 cars per year.

In the Area of Capital Construction

Concentrate the forces of construction and installation organizations on insuring fulfillment of the assignments of the completing year of the five-year plan in the area of capital construction. Direct the activity of builders and installers at raising the effectiveness of production and improving the quality of construction and installation, a saving of building materials, reduction of the duration of construction and the number of uncompleted projects, reduction of the losses of working time and the downtimes of machines and mechanisms. Organize the broad introduction of collective forms of labor organization, the brigade contract, the initiative of the Rostov enterprises to "Work Without Laggards," and also the competition under the slogan "Worker's Relay."

Insure fulfillment of the state plan of capital investments in the amount of 5.6 billion rubles, including by 4.2 billion rubles for the "Electric Power Engineering" sector.

Introduce at projects under construction before the end of the year 17,623,000 kilowatts of electrical capacities, with 4,070,000 kilowatts ahead of schedule, plus 34,700 kilometers of electric power lines with a voltage of 35 kilovolts and higher.

Put into operation a quarter earlier than the established deadline:

hydro-unit No. 6 at the Zeyskaya GES with 215,000 kilowatts;

turbine No. 2 at the Petrozavodskaya TETs-2 for 110,000 kilowatts.

By the 63rd anniversary of the Great October Revolution:

hydro-unit No. 4 at the Sayano-Shushenskaya GES with 640,000 kilowatts;

turbine No. 3 at the TETs of the Perm' Synthetic Rubber Plant with 50,000 kilowatts;

turbine No. 3 at the Kishinevskaya TETs-2 with 80,000 kilowatts;

capacities for production of 3,000 tons of silicon carbide at the Volga Abrasives Plant;

capacities for production of output amounting to 9.3 million rubles per year at the Petropavlovsk Plant for Electrical Insulation Materials imeni M.I. Kalinin.

By Power Engineer's Day--the 60th anniversary of the GOELRO plan:

power block No. 10 at the Reftinskaya GRES for 500,000 kilowatts;

hydro-unit No. 5 at the Sayano-Shushenskaya GES for 640,000 kilowatts;

energy block No. 9 at the Kostromskaya GRES putting 1,200,00 kilowatts into experimental-industrial use;

turbine No. 4 at TETs-25 of Mosenergo for 250,000 kilowatts;

turbine No. 4 at the Novo-Sterlitamakskaya TETs for 100,000 kilowatts;

capacities for producing 4,750 high-capacity "Niva" motor vehicles per year at the Volga Motor Vehicle Plant.

Insure the fulfillment of contract obligations for introduction of energy capacities at foreign facilities.

Insure the submission with good and excellent evaluations for the quality of operations for not less than 80 percent of the industrial projects, electric power lines and substations, apartment buildings and facilities for social and cultural and domestic use.

Raise labor productivity in construction by 4.3 percent, which is 0.1 percent over the plan assignment, on the basis of introduction of the advanced production know-how of the Sevzapenergomontazh and Kavkazelektroset'stroy trusts and the Administration for Construction of the Reftinskaya GRES.

Perform by the brigade contract method not less than 30 percent of the annual volume of operations (2 billion rubles).

Continue the work for introduction of the job-rate wage system and bring its coverage to not less than 70 percent of the piece-rate workers.

Economize additionally, in comparison with the established norms of expenditure, basic materials in construction: 8,200 tons of metal, 23,000 tons of cement and 9,800 cubic meters of sawn timber.

Introduce 32 experimental models of new construction machinery, mechanisms, technological lines and means of automation of construction-installation operations, and not less than 1,120 standard sets of manual and mechanized tools for performing plastering, painting, roofing and other operations, which will make it possible to reduce the volume of jobs performed manually by 2 percent against the established quota.

Reduce unproductive losses of the working time of builders by 10 percent in comparison with 1979 and reduce the downtimes of machinery and mechanisms by 16 percent in comparison with 1979.

Achieve a reduction in the idle periods of railroad cars by 0.1 hours against the norm.

In the Area of Production of Industrial Output at Enterprises of the Industrial Construction Industry

Fulfill the annual plan for volume of sale of output and release of the majority of the major types of products ahead of schedule, by 29 December. Additionally produce output worth 5 million rubles before the end of the year. Obtain the whole increase in product output owing to an increase in labor productivity.

Overfulfill the plan for production of consumer goods by 500,000 rubles.

Bring the volume of produced machine building output with the Seal of Quality up to 8.2 percent of the total volume and increase it by 2.5 percent in comparison with the assignments of the five-year plan.

Manufacture output of the highest quality category above the plan worth 6 million rubles for the "Machine Building" sector and worth 9 million rubles for the "Building Materials Industry" sector.

Certify with the state Seal of Quality 32 types of products, including: special K-50 self-assembling gantry cranes, the KRUKXXV unitized distributor, reinforced concrete centrifuged posts for support of high-voltage electric power lines, foundations under unitized metal anchor-corner and intermediate supports for 35-300 kilovolt overhead lines, and heat insulation materials.

In the Area of Scientific Research, Design and Planning and Surveying

Concentrate the attention of workers in the scientific-research and planning and design institutes of the energy sector on further increasing the effectiveness and quality of scientific and planning work, acceleration of the introduction of the advances of scientific and technical progress in power engineering and construction, the creation of new sources of electric power, industrialization of power engineering construction, accelerated development of nuclear power engineering and fuel-energy complexes, and further development of the creative scientific-technical cooperation with collectives of enterprises and construction projects following the experience of the 28 Leningrad organizations participating in the creation of the Sayano-Shushenskaya GES, for which it is pledged:

To fulfill the annual plan for introduction of new equipment for all sections ahead of schedule, by Power Engineer's Day;

To insure the issue before 15 June of the working documentation on the volume of construction-installation operations for all underway projects for 1981, and to submit during the year not less than 40 percent of the planning and estimate documents with an excellent evaluation;

To obtain economic effectiveness from the introduction of scientific research into production in the field of power engineering of not less than 3.8 rubles per 1 ruble of investment in scientific research against the 3.5 rubles attained in 1979;

To insure growth in the number of inventions by not less than 5 percent in comparison with 1979, and to obtain not less than 1300 author's certificates for invention during the year for projects completed on the level of inventions. To introduce inventions and rationalization proposals in power engineering and construction with ar economic benefit of 210 million rubles;

To insure reduction in the cost of power engineering construction by 30 million rubles, a saving of 90,000 tons of metal and 100,000 tons of cement, and a reduction of labor outlays in construction by 5 million man-days;

To make technico-economic reports:

a) on the use of nuclear sources of energy supply in the Extreme North and the northeast regions of the country by 20 December;

b) on construction of a large geothermal electric power plant in the Dagestan ASSR by 22 December.

Regarding Rendering Aid to Agriculture

In fulfilling the decisions of the 25th party congress and the July 1978 Plenum of the CPSU Central Committee, the collectives of enterprises and construction projects of the USSR Ministry of Power will assist the toilers in agriculture in every way, and will insure early delivery of machinery, equipment, spare parts and materials.

Work will be performed above the plan in kolkhozes and sovkhozes for repair and operation of electrical networks and electrical substations amounting to 400,000 rubles, and organizational and technical assistance will be given in the conduct of repair work on electrical installations, grain threshing floors, elevators and other agricultural facilities participating in harvesting the 1980 yield amounting to 1,950,000 rubles.

They will manufacture and supply to agriculture spare parts worth 440,000 rubles owing to internal resources.

They will conduct mechanization of labor-intensive types of jobs according to the orders of sovkhozes and kolkhozes worth 2 million rubles.

By Power Engineer's Day they will insure early putting into operation of rural electric power lines of 10-0.4 kilovolts, 122,000 kilometers in length, including 250 kilometers above the plan in oblasts of the Non-Chernozem Zone of the RSFSR.

Not less than 55 percent of the rural electric power lines on reinforced concrete supports will be made with excellent and good evaluations.

They will introduce a month before the deadline an animal breeding complex for 800 head in the Kommunar Sovkhoz of Ryazanskaya Oblast and by 22 December they will introduce a swine complex for 24,000 swine in the Doronichi Sovkhoz of Kirovskaya Oblast.

They will fulfill ahead of schedule the annual order of the RSFSR Ministry of Agriculture for manufacture of 50 mobile transformer substations with a capacity of 250 kilovolt-amperes with a voltage of 10-0.4 kilo volts and an experimental batch (10 units) of YaTS-80 cells.

In the Area of the Social Development of the Collectives

In carrying out the instructions of the party and the government for raising the nation's living standard, workers in the energy sector are directing efforts at elimination of the lag which has occurred since the start of the five-year plan regarding introduction of living area and facilities for social and cultural and domestic purposes, improvement of working and living conditions, of educational work in the collectives and strengthening of labor discipline, reduction of cadre turnover, expansion of the network of cultural-enlightenment and sports institutions, and development of the system of economic and mass political work.

For these goals it is pledged:

To train in 1980 in advanced training courses in academic combines not less than 121,000 new workers, to improve the skills of 420,000 workers and

112,000 engineering and technical personnel, and 65,000 managerial personnel;

The assignments of the 1980 Complex Plan of improving the conditions of labor protection and sanitation and health measures for 1976-1980 will be fulfilled by Power Engineer's Day;

To be introduced, in the course of the year in cities and settlements of power engineers and power builders, is not less than 2,234,000 square meters of living area (out of this figure more than 20,000 square meters ahead of schedule and also 7,000 square meters above the plan), kindergartens to accomodate 11,850 (including 560 places ahead of schedule), hospitals with 1450 beds, polyclinics for 4,050 visits, schools of general education for 12,008 pupils, and vocational and technical schools with places for 5,500 pupils;

To lower cadre turnover by 1.8 percent against the 1979 level, including by 1.2 percent in operations, by 3 percent in construction, and by 1.6 percent in the construction industry;

To introduce in 1980 at enterprises and construction sites 37 stores with an area of 17,758 square meters, 66 dining halls with 11,383 seats, 15 vegetable and fruit storage facilities with a capacity of 11,780 tons, two fermenting and pickling centers for 1,050 tons, 13 warehouses with an area of 19,262 square meters, and 9 refrigeration facilities with a capacity of 3,297 tons;

To fulfill ahead of schedule the overall plan of commodity turnover and product output in public catering by enterprises of Glavurs [Main Workers' Supply Administration]. To sell industrial and food products worth 70 million rubles more than was sold in 1979, including worth 6 million rubles above the plan. To bring the level of sale of goods by the self-service method to 52 percent;

To obtain not less than 1,100 tons of weight gain of swine owing to the use of food wastes from public catering enterprises.

In the Area of Protection of the Environment

Construction and installation will be performed to erect facilities for protection of the environment in the amount of 111 million rubles.

The repair and reconstruction of ash traps of 60 boiler units of thermal electric power plants will be performed.

To be developed are:

a) an engineering blueprint of an experimental industrial installation for removing sulfurous anhydride from flue gases at the Dorogobuzhskaya GRES;

b) measures for protection of the Baltic Sea basin, directed at preventing pollution by wastes of energy processing of shales at the Estonian GRES.

The power engineers and energy builders assure the Leninist Central Committee of the Communist Party of the Soviet Union and comrade L.I. Brezhnev personally that they will raise still higher the banner of socialist competition in order to greet worthily the 110th anniversary of the birth of V.I. Lenin and to complete ahead of schedule the plans for 1980 and the Tenth Five-Year Plan as a whole.

The pledges were discussed and accepted at general meetings of collectives of enterprises and organizations of the USSR Ministry of Power Engineering and Electrification and approved by the collegium of the Ministry and the presidiums of the central committee of the trade union of workers in electric power plants and the electrical engineering industry at an expanded session on 10 March 1980.

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POWER ENGINEERING: OVERVIEW OF DEVELOPMENTS

Moscow EKONOMICHESKAYA GAZETA in Russian No 14, Apr 80 p 11

[Article: "Power Engineering in the Land of Soviets"]

[Text] The development of Soviet power engineering has its beginning in the GOELRO [State Commission on the Electrification of Russia] plan drawn up on the initiative of V. I. Lenin in 1920 at the height of the civil war. The plan called for the construction over a period of 10-15 years of 30 electric power plants with a combined capacity of 1.75 million kilowatts and for bringing total electric power generation to 8.8 billion kilowatt-hours annually.

The heroic labor of the Soviet people made it possible to fulfill the GOELRO plan for electric power generation as early as 1931.

As a result of the transformations wrought by Lenin's plans, the Land of Soviets has been developing into an ever stronger energy-producing power with each passing year. Since 1947 the USSR has been Europe's leading and the world's second leading generator of electric power. It is expanding its network of electric power plants. Over the past 15 years the country has created especially large energy-producing giants.

The chart we have published shows only those electric power plants with capacities of more than 1 million kilowatts. It would take more than 2000 symbols to indicate all the power plants within the Minenergo SSR [Ministry of Power and Electrification of the USSR] system alone. Twenty-nine of the 70 electric power plants shown on the map have a rated capacity of up to 2 million and more kilowatts. Currently the largest are the Krasnoyarsk (6 million kilowatts) and Bratsk (4.5 million kilowatts) GES and the Zaporozhskaya, Uglegorskaya and Reftinskaya GRES (more than 3 million kilowatts).

Three turbines, each with a capacity of 640,000 kilowatts, have so far been brought into operation at the Sayano-Shushenskaya GES. There are to be 9 of them altogether. This plant will have the greatest capacity--6.4 million kilowatts. The Ekibastuz fuel-energy complex will include 5 GRES of 4 million kilowatts each. Construction of the "millioniki" power-generating units continues at the atomic power plants in the European part of the country. A 1.2 million-kilowatt power unit is being assembled at the Kostroma GRES.

Control over our energy production is becoming increasingly concentrated. A Unified USSR Electric Power System has now been created. It unifies power plants with a combined capacity exceeding 211 million kilowatts. This unified power system serves an area of more than 10 million square kilometers with a population of more than 220 million people. The distance between the extreme eastern and western points of the YeES SSSR (Unified Electric Power System of the USSR] is approximately 7000 kilometers. It now comprises the unified power systems of the Northwest, the Center, the South, the Urals, Siberia, the Middle Volga, the Northern Caucasus, the Transcaucasus and Northern Kazakhstan. The future will bring the connection of Central Asia and then of the Far East.

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SOVIET ELECTRIC POWER DEVELOPMENT DISCUSSED

Moscow STROITEL'NAYA GAZETA in Russian 20 Apr 80 p 3

[Excerpt from discussion of Soviet electric power development emphasizing AES construction: "An Energy-Producing Power"]

> [Text] Collectives of Minenergo SSR [Ministry of Power and Electrification] enterprises and organizations have assumed the obligations in 1980 to:
>
> bring 17,623,000 kW of electric-power capacity into service in facilities under construction, 4,070,000 kW ahead of schedule, along with 34,700 kilometers of electric-power transmission lines with a capacity of 35 kV and higher;
>
> turn over for operation a quarter ahead of schedule:
>
> --hydraulic turbogenerator unit No. 6, 215,000 kW, at the Zeyskaya GES;
> --turbine No. 2, 110,000 kW, at the Petrozavodskaya TETs-2;
>
> and to turn over hydraulic turbogenerator unit No. 4, 640,000 kW, at the Sayano-Shushenskaya GES by the 63d anniversary of the Great October.

V. Donchenko: During the war I had to deal with the problems involved in transferring electric power facilities from the center of the country to the east. And we frequently used to have to do this under bombing attacks and artillery bombardments and even when we were half encircled. We dismantled the equipment such that we could put it back into operation in its new location in the shortest possible period of time without losing so much as the smallest bolt.

How important this work was can be judged by this statistic: half of the country'e entire electric-power generating capacity was removed from areas threatened with fascist occupation. The council on evacuation, for whose successful performance A. N. Kosygen was to a great degree responsible, accomplished a great deal.

We all understood that every additional kilowatt brought us nearer to victory over the enemy. And this victory was forged as much by the hands of our electric power engineers and construction personnel as by those of the other working people in the rear. Here is one characteristic example: the capacity of Ural electric power generating facilities had been increased 10 per cent by the end of 1941, more than 70 per cent by the end of a year and had been doubled by the end of another year. As compared with 1941, electric power plant capacity in 1944 had been increased 5-fold in Krasnoyarsk, 3-fold in Omsk and doubled in the Kuzbass, Novosibirsk and Bashkiriya.

Construction in this period was primarily of thermal electric power plants, which made possible a 2-3-fold reduction in the time required to bring new capacities into operation. It was at precisely this time that there was conceived the method which came to be the primary one employed in electric power construction: the continuous, flow-line method of power-plant construction and assembly of the operating equipment itself in large, prefabricated units.

Now here is a noteworthy detail: under the difficult conditions of 1943, a group of specialists under the direction of B. Ye. Bedeneyev began work on the development of a long-range plan for developing the country's electric power generating capacity. But the most difficult task lay ahead of them! More than 60 large thermal electric power plants with a total capacity of 5.8 million kilowatts were destroyed during the war years and our largest hydroelectric power plants--the Dneproges, Nizhne-Svirskaya, Kondopozhskaya, Baksanskaya and others--put out of order. But we got the job done!

V. SAPOZHNIKOV: Today it's hard to find an electric power engineer of the old generation who would not have been brought up on the ideas of the GOELRO [State Commission on the Electrification of Russia] or drawn sustenance from its invigorating ideas. The farther along we go, the deeper the understanding we gain of the truth of these words of Lenin's: "Without an electrification plan, we cannot begin any real construction.... Only when the country is electrified and when industry, agriculture and transport have been established upon the technical base required for modern large-scale industry, only then will we achieve final victory."

The distance covered from the first million and a half kilowatts called for by the GOELRO plan to today's 250 million has been one which should be measured not so much in terms of time, but rather mainly in terms of experience. The tasks we face have grown immeasurably. But equipped with the thorough knowledge we have accumulated, we are prepared to accomplish them.

Within the coming 10-15 years we are going to have to increase substantially the capacity of our atomic power plants. Eight atomic power plants are currently in operation. A number of new AES are under construction.

We now have before us the task of rapidly constructing AES with capacities of up to 6 million kilowatts with individual unit capacities of up to 1 million kilowatts. But these new plants will be built taking the 20 years' experience we have accumulated into account. At the same time, though, we'll be building them differently. In the first place, the safety requirements have changed and, secondly, the equipment and its characteristics are different.

Another area of our power resource development is the exploitation of the enormous coal, oil and gas deposits in the eastern part of the country. The first unit has been put into operation in the Ekibastuz fuel-energy complex. Taking the adjoining regions into account, a total capacity of 24 million kilowatts is to be brought into service here.

The scales involved in the Kansk-Achinsk basin are even more impressive. Eight plants with a total capacity of 51.2 million kilowatts are to be constructed there within the coming 15 years in the first stage alone. The foundations for the first plant, the Berezovskaya, have already been laid. Our ministry has been charged with the construction here of a large, modern industrial city. The very task of creating an energy-industry complex like this is itself a unique one, one requiring different measures, different approaches.

We also have ahead of us the task of building a large compelx around the casing-head and low-pressure gas in the Surgutskiy and Severo-Tyumenskiy regions. The plants here will have a combined capacity of 19 million kilowatts. Together with the task of putting up the special 1.5-million-volt electric-power transmission lines, a task which nobody in the world has ever before undertaken, all this illustrates the complexity of the tasks involved and paints the exciting picture of our power-engineering future. In light of this, our power-engineering stands on the threshold of great transformations.

Technical planning is now underway on the country's first Yuzhno-Ukrainskiy electric power complex, which will comprise hydraulic, hydraulic accumulation and atomic electric power plants, as well as on special comprehensive, integrated programs for the construction of pilot solar and geothermal power plants. These are more of the features characterizing today's power-engineering picture.

M. SHEPETUKHA: I recall when the Dneproges was still under construction and I was working in the Black Sea shipbuilding yard in Nikolayev. A. Vinter came to the yard to place an order for the Dneprostroy. The order was filled without regard for any established priorities. This emphasizes once again that electric power development is a concern of the entire country. In the 1960's I had to concern myself with developing plans for the electrification of the Ukraine. As I went back over the old sites I saw how rapidly Soviet power engineering, a product of Lenin's ideas, is developing.

L. VORONIN: Enormous tasks connected with the further development of the country's energetics are resting on us. But the experience of those of the older generation is an invaluable asset. We can learn a lot from them, even when it comes to the pace and enthusiasm with which we work.

A great many AES are characteristically being built on sites where electric power construction projects were once developed during the early five-year plans. Their new and increased generating capacity will reinforce that of early Soviet power plants. Only the capacity of the new ones of course will be immeasurably greater. The RBMK-1000 and VVER-1000 "millioniki" fast neutron reactors will surpass all previous reactors. The only goal ahead of today's engineers is to achieve the same pace of construction operations as was achieved, for example, in building the Dneproges.

This is being done in a number of instances. During the construction of the Kursk AES, for example, a reactor weighing a total of a thousand tons was assembled parallel with the construction of the building itself. Using an air-cushioned platform, the thousand-ton unit was then transferred and placed in its designated position.

Power from atomic electric power plants has already become our daily bread, as they say. Not a single national fuel-energy balance could be achieved without it. Atomic electric power plants produced 54.8 billion kilowatt-hours last year--as much as the USSR produced in 1947.

V. SEMENOV: As a representative of the central load-dispatching administration, I would like to say that the USSR's unified electric power system has become a reality, a new stage in power-engineering development in our country. It can without overstatement be spoken of as a monument to Vladimir Il'ich and his grandiose idea of the electrification of the entire country. In parallel operation are now 735 electric power plants with a combined capacity of 211 million kilowatts. The distance from the eastern to the western extremes of the network is 6,000 kilometers, 6 time zones. Three thousand kilometers from north to south. Controlled from the TsDU [Central Dispatching Administration of the Integrated Power System of the Socialist Countries] building, this is the largest electric power netowrk in the world. Its realization will make possible a 5-10 per cent economy of rated operational capacity.

The network is still being developed. A unified Central Asian electric power system will eventually be tied into it; the connection of eastern electric-power transmission lines, those along the Baykal-Amur Mainline for the most part, will make it possible for us to say in 10-15 years or so that we have completed our work on the development of a unified national electric-power system.

The task isn't easy now. We have few reserves. But in spite of everything, our unified power system will be operating stably and dependably for many decades. Its electric-power transmission lines have already stepped beyond the borders of our own country and tied it in with the Mir electric power system unifying the power systems of the European countries--the Comecon member countries as well as Mongolia, Finland, Norway and Turkey.

8963
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ELECTRIC POWER

DAUGAVSKIY GES CASCADE CONSIDERED VERY IMPORTANT PROJECT

Riga SOVETSKAYA LATVIYA in Russian 15 Apr 80 p 2

[Interview with Nikolay Fedorovich Cherepov, chief of Daugavagesstroy, in Salaspils by SOVETSKAYA LATVIYA correspondent; date of interview not given: "The Main Regulator of the Cascade"]

> [Text] The Daugavpilsskaya GES, construction work on which began at the end of last year, will be the republic's most important construction project in the Eleventh Five-Year Plan. In line with good tradition, the editors of our newspaper are taking the new construction project on the Daugava under their patronage, just as they did in the case of the construction of the Plyavin'skaya GES imeni Lenin and other important facilities. Beginning today, our newspaper will carry regular reports on the work of the hydraulic engineers involved with the project and on the problems they have had to solve.
>
> The Daugava GES cascade now comprises three electric-power stations--the Plyavin'skaya, the Kegumskaya and the Rizhskaya. Daugavagesstroy administration personnel put much work into each one of them. They have now been charged with construction of the Daugavpils GES.
>
> Our correspondent visited Salaspils, where is located Latvia's main hydraulic engineering center, and asked Daugavagesstroy's chief, Nikolay Fedorovich Cherepov, to familiarize our readers with the unique features of this new construction project.

[Question] First of all, Nikolay Fedorovich, please tell us what made the construction of still another GES on the Daugava necessary.

[Answer] There are many reasons. It is clearly first worthwhile recalling that all Daugava GES together comprise the Unified Northwest Electric Power System, in which there is a preponderance of electric power stations with equipment which is not highly regulated (GRES, TETs). There can consequently be little reliance on them during peak load periods. It can be seen that to fire up another boiler would take hours, while only a few minutes would be required to start a hydraulic turbo-generator unit. That's why each hydroelectric power station is so important, including the Daugavpils station, although it will be of comparatively low capacity--300,000 kilowatts.

The new GES will not only be able to handle peak loads, but it will also make possible more efficient utilization of the Daugava's hydraulic potential at the other electric power stations in the cascade. The key point is that it will become its main regulator. Putting the Daugavpils GES into operation will also make it possible to save substantial quantities of solid fuel. According to calculations by specialists, it will save approximately 380,000 tons of coal each year.

[Question] As we can see, the construction of the primary station of the Daugava cascade promises to be of benefit not only to the power engineers.

[Answer] That's absolutely true. Construction of this hydraulic power system will create favorable conditions for establishing engineering protection for a number of cities and settlements against flooding, improve the water supply of Daugavpils and a number of other areas adjacent to the reservoir, and promote the development of water transport, fishing and the irrigation of agricultural land. It will also improve things by eliminating a number of obstacles to transportation. The site of the GES was selected so as to reduce losses during flooding of the reservoir to a minimum. As calculated by the designers, expenditures for construction of the Daugavpils GES will be recouped within eight years.

[Question] Please familiarize our readers with the basic design of the future GES.

[Answer] I think the GES will be a splendid addition to the panorama of the Daugavpils area. Plans call for the basic structures to be located on the right-bank flood plain of the river. The hydroelectric power station building itself will be erected here with surface spillway for 8 spans of 11 meters each. The electric power station will be the first on the Daugava to have installed horizontal capsule hydraulic turbogenerator units, which are very economical and do not have to be set deep within the body of the dam.

Earthen dams approximately one-half kilometer in length altogether and 5-28 meters high adjoin the structure of the GES by means of connecting walls. The pressure face of the hydraulic complex will create a reservoir approximately 200 kilometers long which will follow the river valley. It will vary between 500 and 2000 meters in width.

Realization of these plans for an operational hydraulic complex will require the removal of approximately 4 million cubic meters of earth, the pouring of almost 300,000 cubic meters of concrete and reinforced concrete and the erection of 12,000 tons of metal structures.

[Question] And how long is it planned for the work on this complex to take?

[Answer] It's still difficult to give any exact sequence of all the operations that will be involved, but we think we'll be able to have all eight units on load by the end of the Eleventh Five-Year Plan. Preliminary operations are now in full swing. We have at least six times as much to accomplish this year as we did last year. We are trying to put up a personal services facility near the main structures, complete the assembly and installation of a construction equipment center and build two of the first houses in the hydraulic engineers village.

[Question] How would you evaluate the rate at which the work is moving along in the first stage of the construction and could it be stepped up any?

[Answer] This is the question that's probably the hardest of all to answer. On one hand, many of our hydraulic engineers, especially veterans like G. Primak, V. Chesnokov, and others, are working at a shock pace and continually overfulfill their target tasks despite the difficult conditions of the initial period. On the other hand, we frequently fall behind our original schedules. It's entirely reasonable for you to ask what the difficulty is. The whole problem lies in the fact that preparation of the design documentation for many facilities is lagging behind our plans. And there can be no doubt that a large share of the blame lies with the customer, in the instance the management of the Daugava GES cascade, which is still indecisive in the pressure it's putting on the designers. There will be plans, but it isn't the hydraulic engineers who are holding things up.

8963
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ELECTRIC POWER

KAZAKHSTAN POWER ENGINEERING HISTORY BRIEFLY OUTLINED

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 4, 1980 pp 56-58

[Article by Honored Power Engineer of the Kazakh SSR I. Balgayev, Director of the Kazakh Division of "Energoset'proyekt" Institute, and Engineer Ye. Balgayeva: "Second Party Program"]

[Text] K. Marx and F. Engels, the founders of scientific communism, foresaw a very great role for electric power in the life of society. In a conversation with W. Liebknecht, K. Marx said: "The reign of His Majesty, Steam, which overturned the world this past century, has ended and in its place there arises an immeasurably more revolutionary force, the electric spark. The problem has now been solved, and the consequences of this fact cannot be calculated. One necessary consequence of the economic revolution will be a political revolution, since the latter is only an expression of the former."[1]

This prevision was fully justified. In 1917, the Great October Socialist Revolution was accomplished in Russia.

V. I. Lenin, creator of the first socialist state, linked the building of socialism inseparably to the creation of large-scale machinery-dominated industry and considered electrification to be the basis for developing the material and technical base of communism, of fundamental restructuring of the entire national economy. "Only," he said, "when the country has been electrified, only when a technical base for modern, large-scale industry underlies industry, agriculture and transport, only then will we be ultimately victorious."[2]

It was particularly urgent that this task be posed, in view of the fact that the Soviet state inherited an extremely backward power economy from Tsarist

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[1] "Vospominaniya o Markse i Engel'se" [Recollections of Marx and Engels], Gospolitizdat, 1956, pp 91-92.

[2] V. I. Lenin, "Poln. sobr. soch." [Complete Collected Works], Vol 43, p 228.

Russia. In 1913, Russia was 8th in the world in electric power production and produced 15-fold less electricity than the USA and 2.5-fold less than Germany. Moreover, electric power generation in Russia decreased from two billion kilowatt-hours in 1913 to 500 million kilowatt-hours in 1920. The destruction caused by the imperialist and civil wars took its toll.

Then, under these most difficult conditions of want and hunger, V. I. Lenin put forward the apparently fantastic, for that time, idea of electrifying Russia. On 23 January 1920, he sent G. M. Krzhizhanovskiy a letter posing the concrete task of providing now a political or state plan for electifying the country, one which would "involve the masses of workers and conscious peasants in a great 10- or 20-year program."[1]

That became the GOELRO [State Commission for the Electrification of Russia] plan. It anticipated developing all the basic branches of the national economy with consideration of the features of the individual economic regions. Reliance was placed not on the construction of isolated power stations, but on the development of power systems supplying entire regions with power. The GOELRO plan was approved in December 1920 by the 8th Congress of Soviets. On 22 December 1920, V. I. Lenin evaluated the GOELRO plan in his report on the activity of the Sovnarkom [Council of People's Commissars] at the 8th Congress of Soviets. He said: "In my view, this is our second party program...."

The plan was to restore the prewar power engineering level and build 30 new, large, regional electric power stations with a total installed capacity of 1,750,000 kW over a 10-15 year period. For the times, that was an ambitious problem. Also important was the fact that the new electric power stations were to be built in all regions of the country, including Siberia and Turkestan.

The tsarist government was not concerned at all about the economic development of the national outreaches and even consciously retarded it. Prior to the revolution, the status of power engineering in our area reflected very eloquently its economic and sociopolitical position in the country. The power of all its electric power stations did not exceed 2,500 kW.

In the very first period of electrification, the electric power economies of the national republics of the Soviet Union were developed rapidly and were the basis of their industry. Whereas power generation for the USSR as a whole in 1930 had increased 4.1-fold as compared with 1913, the figure was 5.4-fold for Kazakhstan. The first hydroelectric power station in the republic to be built under Lenin's GOELRO plan was the Khariuzovskaya GES on Gromotukha River; it was 3,000 kW (first line).

In 1932-1935, central electric power stations (TsES) went into operation -- Karagandinskaya, Kentauskaya, Alma-Atinskaya -- along with the Chimkent Lead Plant and central heating and power plants for the Semipalatinsk Packing

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[1] V. I. Lenin, "Poln. sobr. soch.," Vol 40, pp 62-63.

Plant and the Aktyubinsk Chemical Combine. The Balkhashskaya TETs, equipped with large (for those times) units of 25,000 kW each was put into operation in 1937. That same year, the 27,600-kW Ul'binskaya GES was put into operation. Electric power plants were built at transport enterprises and in rayon centers.

Construction of the Ust'-Kamenogorskaya GES on the Irtysh, the Karagandinskaya GRES-1 and a number of others was begun during that period.

In prewar 1940, some 631.7 million kW-hr of electric power was produced in Kazakhstan. Production had increased 487-fold (!) since 1913. Electric power station power had increased from 2,500 kW to 224,000 kW.

The treacherous attack on the USSR by the Fascist hordes disrupted the peaceful, creative labor of the Soviet people. Many industrial enterprises were relocated in Kazakhstan. They needed electric power. It was for good reason that electric power station capacity and electric power generation in the republic increased 1.8- and 1.83-fold, respectively, during the war years. Electric power output in 1945 exceeded 1.1 billion kilowatt-hours.

During the first post-war years, power engineering in Kazakhstan was developed primarily through the construction of relatively small power stations in the cities, industrial centers and at individual enterprises and through extensive construction of diesel and interkolkhoz GES's in rural regions. They naturally could not fully meet the demand. However, this temporary solution was the only correct one at that time. The opportunities available did not enable us to shift to the creation of large power associations until the mid-1950's.

One exception was eastern Kazakhstan, where the Altay power system was formed in 1952 with the start-up of the largest GES in Asia, the 330,000-kW Ust'-Kamenogorskaya on the Irtysh. By that year, the Ul'binskay Hydroelectric Power Station, the Ust'-Kamenogorskaya TETs and other stations were already operating here.

By the 1960's, another series of power systems, power centers and power combines had been created in the republic to supply electric power to the oblast centers, individual cities, their suburbs, industrial centers and rayons. The largest were the Karaganda and Alma-Ata power systems and the Chimkent and Aktyubinsk power centers. During the first 15 post-war years, the capacity of the power stations increased 9.6-fold and electric power production increased 9.1-fold. In 1960, some 10.5 billion kilowatt-hours of electric power was generated in Kazakhstan by power stations with a total power of 3.2 million kilowatts.

In the past 20 years, Kazakhstan has become an ambitious construction site. During these years, very large territorial-production and production complexes have been created in the republic. Electrification of the railroads has taken on broad scope. Gas and oil mains have been laid in Kazakhstan. Housing and municipal-services construction has been intensive in the cities and villages. This growth in republic productive forces has been ensured by corresponding growth in the power base. Republic electric power generation in 1980 will have grown 6.5-fold as compared with 1960. There will be a total of 365,120 km of electric power lines, as against 46,800 km in 1958.

The tremendous achievements of Kazakhstan power engineering are clearly evident in the following table.

Per Capita Electric Power Generation, in kW-hr per person

	1960	1965	1970	1975
Kazakhstan	1,147	1,614	2,682	3,660
ARE [Arab Republic of Egypt]	100	187	228	225*
Brazil	328	373	487	747
Iran	93	125	246	394
Italy	1,132	1,609	2,192	2,636
Pakistan	--	68	145	--
Turkey	102	161	239	395
France	1,649	2,168	2,895	3,537

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*1974 indicators

As is evident from the table, Kazakhstan has caught such developed capitalist countries as Italy and France in terms of this indicator.

Kazakhstan produced 14.4-fold more electric power per capita in 1975 than the ARE, 9.3-fold more than Iran. In terms of electric power production, Kazakhstan is behind only Japan and India in Asia, but back in 1975 it was already producing more than three times as much electric power as Turkey, more than four times as much as Iran and more than six times as much as Egypt. Such countries as Turkey, Pakistan, Iran, Indonesia, Egypt and Algeria produce less electric power combined than Kazakhstan. Even such West European countries as Austria, Belgium, Denmark, Portugal and Switzerland produced less electric power than Kazakhstan in 1975.

The quantitative growth in power engineering has also been accompanied by qualitative changes. In the 1960's and 1970's, large regional electric power stations (GRES) and central heating and power plants (TETs) were built with high steam parameters and large unit power. Among them were the KarGRES-2, with a capacity of 700,000 kW generated by 100,000-kW units, the Dzhambulskaya GRES, with a capacity of 1,240,000 kW generated by 200,000- and 210,000-kW units, and the Yermakovskaya GRES, with a capacity of 2.4 million kW generated by 300,000-kW units. (In the preceding decade, the unit power did not exceed 100,000 kW.)

TETs capacity has grown. In the Eighth through the 10th five-year plans, we have built the Pavlodarskaya TETs-3, with a capacity of 500,000 kW generated by 50,000, 60,000 and 110,000-kW units, TETs-2 of the Karaganda Metallurgical Combine, with a capacity of 300,000 kW generated by 100,000-kW units, and the KarTETs-3, 220,000 kW.

Much work has been done during these five-year plans to renovate and expand a large number of previously built TETs with the installation of modern power equipment and units with individual capacities of 50,000 to 100,000 kW.

As the power economy has grown, power engineering has become more concentrated, with individual stations and centers being combined into power systems and linked to one another.

Along with construction of power stations on a large scale, construction has also occurred on the power distribution system. For example, 220-kV lines have been installed from Tselinograd to Atbasar to Yesil' to Kushmurun to Lisakovka, from Tselinograd to Alekseyevka to Makinsk to Kokchetav, and from Petropavlovsk to Kokchetav; 500-kV lines have been installed from the Yermakovskaya GRES to Tselinograd, from Tselinograd to Yesil' to Sarbay, from Sarbay to the Iriklinskaya GRES (in Orenburgskaya Oblast) to Yermak to Rubtsovsk to Ust'-Kamenogorsk, from Ekibastuz to Karaganda to Agadyr'....

The Northern Kazakhstan OES [integrated power system] is the link connecting the European and Asian portions of the country's Unified Power System. An important power bridge linking the West Siberian power systems with the European system is the 500-kV power transmission line from Rubtsovsk to Yermak to Ekibastuz to Tselinograd to Sarbay to the Iriklinskaya GRES. The power supply for Aktyubinskaya and Ural'skaya oblasts is based on the Central Volga OES, and the Gur'yevskaya Oblast system is still isolated.

Mangyshlakskaya Oblast is supplied with electric power from its own sources. The first nuclear power plant using a fast-neutron reactor to be built in the world is in Shevchenko.

The party and government are constantly concerned about the outstripping development of Soviet power engineering, including in Kazakhstan. In his speech at the November (1979) CPSU Central Committee Plenum, L. I. Brezhnev said, "...we must accelerate utilization of the Ekibastuz, Kansk-Achin and Kuznetsk fuel and energy complexes and, of course, installation of appropriate power transmission lines, and foremost the Ekibastuz-Center 1,500-kV d.c. line."

In the near future, a unique, unparalleled energy complex will be created in Ekibastuz. Four thermal electric power plants with a total capacity of 16 million kilowatts will be built in a small area. The super-high voltage 1.5 million-volt d.c. power transmission line to the Center will begin at Ekibastuz. The construction of Elektrograd will raise Soviet and Kazakhstan power engineering to a qualitatively new level.

Ekibastuz GRES's 1 and 2 are now being built. In 1980, the first 500,000-kW units will be put into operation at GRES-1. Preparatory work on construction of the Southern Kazakhstan GRES, which will also be part of this complex, has been begun near Lake Balkhash. It will include 500-kV power transmission lines from Ekibastuz to Karaganda, from Agadyr' to Dzhezkazgan, from the Southern Kazakhstan GRES to Alma-Ata, and others. The republic power system will join the country's Unified Power System through the Central Asian OES with the start-up of the YuzhGRES and the 500-kV transmission line between northern and southern Kazakhstan.

Kazakhstan is rightly considered the largest supplier in the country for nonferrous metals, phosphorous and phosphate fertilizers for the national economy and the most important base for grain and stock-raising output production. With the development of the unique Ekibastuz area GRES's, it will also become the most important producer of electric power in the country.

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FUTURE PLANS OUTLINED IN CONFERENCE

Kiev RABOCHAYA GAZETA in Russian 27 Apr 80 p 1

[Text] The USSR has laid a solid scientific foundation for further development in the field of power engineering. This is the main conclusion drawn by a conference on this problem which concluded its work today in the Ukrainian capital.

"The construction of atomic electric power plants," declared G. Ye. Pukhov, academician of the Academy of Sciences of the Ukrainian SSR and chairman of the conference organizing committee, "is the key direction in which to build up the Soviet Union's energy-producing capacities, as has been emphasized at this meeting of scientists and specialists from Moscow, Leningrad, Kiev, Minsk, Novosibirsk, Irkutsk and other cities. In our republic alone, for example, plans call for AES to account for more than half of the increase in electric power planned for the five-year plan. A sure guarantee of the development of atomic power engineering is to be found in the fact that the USSR is the first country in the world to introduce the fast-neutron reactor. This inspires hope for a successful solution of the nuclear fuel problem."

The development of electric power complexes around them will contribute to a substantial degree to increasing the operational efficiency of these atomic power plants. In addition to the AES they will comprise hydraulic accumulation plants, which are designed to accumulate and then release energy during the "peak" hours. This approach has already been realized at the Yuzhno-Ukrainskiy power complex now under construction. Plans call for the construction of several more giants like this in the years immediately ahead.

Our researchers and skilled workers have also made substantial contributions to the solution of other problems in this most important branch of the national economy. Mathematical and electronic "simulators," among other things, are being developed to test the reliability of electric power systems and equipment; successes have been achieved in the search for optimum designs of superhigh-power generators; improved automated control systems have been proposed. Possibilities for the exploitation of nontraditional energy sources--the sun, wind, geothermal heat, hydrogen--have more realism.

Conference participants heard approximately 400 scientific papers and reports and outlined directions for future research.

8963
CSO: 1822

ELECTRIC POWER

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ASH, SLAG REMOVAL SYSTEMS DEVELOPED FOR POWER PLANTS

Moscow ENERGETIK in Russian No 3, Mar 80 pp 31-32

[Article by L.N. Zhingel', A.V. Zhuykov, I.I. Polovitskiy, B.L. Vishnya, and V.M. Ufimtsev, engineers, Uraltekhenergo: "Long-Range Development of Ash and Slag Removal Systems for Thermal Electric Power Plants (TES)"]

[Text] With the existing tendency of a further increase in the use of solid fuel at thermal electric power plants it follows to expect a constant increase in ash-slag residues. Produced in 1977 at TES in the form of ash and slag was more than 70 million tons of waste products. By 1985 the amount of them, apparently, will increase to 115 million tons.

The absence of free spaces for ash dumps near electric power plants located in densely populated regions hinders the storage and creates the necessity of removing them by transport means over great distances (25-30 kilometers), which is connected with large capital and operating expenses.

The GZU [hydraulic ash removal] system used at thermal electric power plants for transporting ash and slag residues has a number of essential shortcomings:

high cost;

need for considerable plots of land for ashdumps, for instance in one of the power systems with the output of 10 million tons of ash and slag residues, 4,000 hectares of land is occupied by ash dumps;

the need for a large expenditure of water for transporting the ash-slag pulp, comprising at operating electric power plants 10-15 tons of water per 1 ton of ash;

the pollution of surrounding water sources by compounds of fluorine, arsenic, vanadium and other elements.

One of the ways of solving the problem of disposal of the ash-slag residues (ZShO; zoloshlakovyye ostatki) is the introduction of systems of dry ash removal and the use of the ash by consumers. This is confirmed by foreign experience. For instance, in France the quantity of utilized ash comes to 78 percent, in the FRG 75 percent, and in Belgium 57 percent.

The work experience of domestic thermal electric power plants also shows that schemes of pneumatic ash removal with shipment of the ash to consumers operate successfully. The broad introduction of electrofilters as the most promising ash traps will make it possible in the future to replace the hydraulic ash removal systems.

At the present time the best among the systems of internal pneumatic ash removal are the systems of air channels with flap valves developed by Uraltekhenergo [not further identified], and systems of air channels with air-layer gates, developed by the All-Union Institute of Heat Engineering imeni F.E. Dzerzhinskiy jointly with the All-Union State Institute for Planning Electrical Equipment for Heat Engineering Installations (VGPI TEP).

The system of air channels with flap valves underwent extended industrial testing at the Novosibirsk TETs-3 [Heat and Electric Power Plant] with the delivery of ash from Kansk-Achinsk coals.

The system operates reliably. Troubles arise basically when fed in with the ash are large and sharp metallic objects, causing jamming of the flap valves and mechanical damage of the air channel walls.

Installation of cut-off gates in front of the flap valves made it possible to eliminate the troubles indicated.

Experience shows that it takes about 4 hours to replace the walls, and the replacement is done without stopping the boiler. A set of spare lower chambers of the air channels with a tight microporous wall makes it possible significantly to reduce the time for replacement of the wall. The wear of the cut-off gates is insignificant.

Analysis of the results of a survey showed that in five years of operation of pneumosystems at the Novosibirsk TETs-3 not one of the plates required replacement. The service life of porous walls made of TSF(a)-9P fabric comes to not less than two years.

At the present time systems of this type are being planned by Uraltekhenergo for the boilers of blocks with a capacity of 500 and 800 megawatts with a discharge of ash and slag of 100 tons per hour and more. Wide use of systems of this type is planned at thermal electric power plants being designed by UralTEP [Ural State Institute for Planning Electrical Equipment for Heat Engineering Installations], NOTEP, NOTEP [not further identified] and other planning organizations.

Systems of air channels with air-layer apparatus have been installed and are operating successfully on boilers of blocks with a capacity of 200 megawatts at the Estonian GRES and on boilers of the Baltic GRES.

In 1978, systems of air channels of the Estonian GRES, equipped with air-layer gates, were surveyed by specialists from Uraltekhenergo. It was established that the reliability of internal systems does not require reservation of the hydraulic ash removal system, however they have some shortcomings:

the short service life of the porous walls in the air channels and in the air-layer gates made of nonrubberized transport cotton tape (less than 6 months) due to their burn-out;

the need for critical equipment for driving the air-layer gate with compressed air from the pneumatic pump (TV 30-1.8), and the air expenditure of 400-500 m^3 $(hr \cdot m^2)$;

the system with the air-layer apparatus is inferior in economy to the system with flap-valves, but surpasses it in convenience of arrangement of the equipment in premises with a height limitation.

It is necessary to include among the merits of both systems the wide range of productivity and working capacity with any regime of entry of the ash into the system.

The basic error committed when planning and introducing systems of internal ash removal using air channels is the reservation of the system of air channels with a system of hydraulic ash removal by the installation of ash-washing apparatus under each bin of the electrofilter. This leads to the ash sticking on the wet sections and causes intensive corrosion of the switching mechanisms.

In order to increase the reliability of systems of air channels for power blocks with a capacity of 500 and 800 megawatts, and also systems of air channels unifying the electrofilters of two and more boilers, it is necessary to provide for back-up of the unit-construction air channel with a second parallel air channel.

Pneumatic screw-type pumps with feeding of the ash along pipelines into silo storage facilities have received the greatest distribution as external pneumotransport in power engineering. The highest capacity systems of external pneumatic ash removal are operating at the Baltic and Estonian GRES's with an annual shipment volume of more than 1 million tons.

The basic technical data of the systems are given below;

	Estonian GRES	Baltic GRES
Productivity, tons per hour	43	13.6
Diamter of transport pipeline (internal), millimeters	180-250	160
Line length (geometric), meters	480-800	900
Pneumatic screw pump	NPV 63-4	NPV 36-4

During the operation of the systems their adequate reliability in operation was confirmed.

In addition to pressure pneumosystems, vacuum pneumosystems are used in power engineering for transporting ash-slag residues over short (100-150 meters) distances. However, despite a number of indisputable advantages, in pneumotransport of ash-slag residues, the share of transportable free-flowing materials in power engineering is very small.

Introduction of systems of dry ash and slag removal is greatly hindered by the imperfection of the methods of utilisation of ash, despite the fact that the properties and chemical composition of power engineering ash have been well studied and have specific recommendations for their use in the national economy.

Especially valuable is the ash of Kansk-Achinsk coals, possessing cementing properties, and on the basis of which construction of a number of large thermal electric power plants is proposed.

One of the directions expanding the use of dry ash and slag removal at thermal electric power plants is the creation of new schemes of ash removal, making it possible to dispatch the ash directly to the consumers or to process it into construction semi-manufactures in the form of granules, or brick which can be stored in dry form.

The results of studies made by the Ural Polytechnical Institute show that such semi-manufactures have a strength exceeding 100 kgf/cm^2. This makes it possible to predict the creation of dry ash dumps, since the cost of the equipment for preparing the semi-manufacture and its transportation is 3-4 times cheaper than the construction of an ordinary hydraulic ash removal system with a wet ash dump. In addition the hydraulic ash removal systems rapidly break down if the ash possesses cementing properties.

Such a technology of collection, processing and storage of ash and slag residue and its technico-economic substantiation were worked out by Uraltekhenergo jointly with the Ural Polytechnical Institute applicable to the Novisibirsk TETs-5.

Another route making it possible to expand the introduction of dry ash and slag removal at thermal electric power plants is the system of collection, transport and storage of ash and slag residue in dry packed form at an ash dump.

Such systems are rational for ash and slag residues containing a small quantity of cementing compounds (Ekibastuz, Kuznetsk, Donets and other coals).

Such systems are aleeady known and being used at new electric power plants in the United States. Thus, for instance, known are systems with the transportation of ash under pressure along pipelines, with the delivery of it in dry form to the ash dump, with dust suppression by water at the outlet to the end point, and with spreading, packing and rolling of the ash at the ash dump.

Also known are systems with transfer of the ash by motor transport to the ash dump after the ash has gone through preliminary wetting, and with transfer of ash which has not been wetted using specialized air-tight transport.

Developed for electric power plants in the eastern states of the United States were methods of storing dry compressed ash in deep troughs with the use of above-ground and underground drainage canals for run-off of atmospheric precipitation.

With such a method of storage it is not required to build evaporation units, antifiltration and other expensive units at the ash dumps. After elapse of the period of operation, such as dumps, according to American data, have a fully acceptable appearance and can be used for parks, construction of apartment buildings or light industrial facilities. At the present time in the United States being planned for certain thermal electric plants are individual ash storage areas of large capacity, with the goal of further development and use of the ash-slag residue for industrial needs.

The enumerated systems of ash and slag removal are of great interest, however they require industrial verification in the severe climatic conditions of the central zone and also the north and east of our country.

At the present time Glavuralenergo jointly with Uraltekhenergo have embarked upon an industrial experiment for dry transporting and packing of ash-slag residue on a test field 100X100 meters in size at the Verkhne-Tagil'skaya GRES.

Conclusions

The operating experience of pneumatic ash removal systems shows the promise of their introduction with the simultaneous requirement of increasing the reliability of operation of individual units.

The ash and slag of thermal electric plants are a valuable raw material and should be used to the maximum for industrial and construction purposes.

The need has come to a head for a change in the traditional schemes of hydraulic ash removal and "wet" ash dumps, for development and introduction of new, more progressive methods for transporting and packing ash and slag and their storage at ash dumps.

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ENERGY CONSERVATION

MEAT INDUSTRY PROGRAMS OF FUEL, ENERGY CONSERVATION

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 5, May 80 pp 1-3

[Article by V. V. Mikhov, USSR Ministry of the Meat and Dairy Industry: "Conservation of Fuel and Energy Resources--The Most Important National Task"]

[Text] The November (1979) Plenum of the CPSU Central Committee focused especial attention on improving the fuel and energy balance in the country. In his speech, General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev noted that no matter how fast power engineering develops, saving of fuel and energy will be the most important national task, and therefore it is necessary to think out again and again the entire set of energy problems.

The enterprises of the USSR Ministry of the Meat and Dairy Industry are a large consumer of fuel and energy resources. They annually consume over 8.6 million T of conventional fuel, 51.3 million Gcal of heat, and about 6.8 billion kw-h of electricity. A saving of 1% of the energy resources alone will permit a reduction in the net cost of the manufactured products by 5 million rubles.

Analysis of the activity of the industry for efficient and economical expenditure of fuel and energy resources demonstrated that recently a number of measures have been taken to increase the efficient use of the power equipment. In 1977-1979 almost 2,000 obsolete steam boilers were replaced, 375 boiler houses were reconstructed, and 233 boiler houses were switched to progressive types of fuel (gas and liquid fuel). The combustion process has been automated at 771 boiler units, and 131 economizers have been installed. To improve the accounting for fuel, heat and water, and to strengthen control over the composition of the exhaust gases a considerable number of steam and water gages, gas analyzers, and control and measuring instruments were installed. About 500 heating systems have been reconstructed, and hot water is being used as a heat carrier instead of steam. In order to save electricity, static capacitors for 150,000 kilovars have been introduced at the active enterprises, and 334 photorelays of external illumination have been installed.

A lot of attention is being paid to the improved operation of power equipment. During the last 3 years, at 1,365 boiler houses performance adjustment work has been done with the compilation of performance charts; over 21,000 workers of the power engineering services have undergone training and retraining. In the Leningrad Technological Institute of the Refrigeration Industry courses have been organized to improve the skill of the chief power engineers of the ministries in the union republics, industrial and production associations and enterprises. For a further improvement in work for the efficient use of fuel and energy resources at the enterprises of the USSR Ministry of the Meat and Dairy Industry of great importance were the recommendations of the all-union scientific and practical conference, at which the main directions were adopted for a further increase in the efficient expenditure of energy resources for 1980 and the 11th Five-Year Plan.

The Moscow Technological Institute of the Meat and Dairy Industry is rendering method assistance to improve the operation of power equipment and the use of secondary energy resources in production. The institute specialists have prepared guiding technical materials for the efficient operation of boiler units of the branch enterprises: calculation, installation and operation of highly efficient thermal insulation, equipment and pipelines, etc.

The scientific and planning organizations of the branch have made a certain contribution to the efficient and prudent consumption of energy resources.

The technology for producing sausage items without casing that was suggested by the VNIIMP [All-Union Scientific Research Institute of the Meat Industry] makes it possible to reduce the outlays of electricity per 1 T of finished product from 203 kw-h to 43.7 kw-h, or 4.6-fold.

The scientific production association "Kompleks" completed work to perfect the methods of controlling drying of feather and down raw material, and created the hygrometer-alarm GP-215, whose introduction reduces the consumption of electricity due to the stablization of the process.

The introduction of cold storage batteries upon the recommendations of the VNIKhI [All-Union Scientific Research Institute of the Refrigeration Industry] alone permitted an economic effect of 100,000 rubles at 48 enterprises of the Ukrainian SSR Ministry of the Meat and Dairy Industry.

In 1979 new instructions were approved for standardization of consumption of fuel, heat and electricity for the enterprises of the meat industry, which will permit regulation of the standard of energy resource consumption on a scientific basis.

The planning for the enterprises of the meat industry in Tyumen', Omsk, Omsk-Kirovsk, Astrakhan', Volzhsk, Mukachev, Yerevan, Leningrad and

Klayped provides for their heat supply from a TETs and affiliated boiler houses, which yields a saving of over 3,400 Gcal per year.

The plans for a number of meat kombinats plan to use for the systems of heating and ventilation superheated water (150/70°C), as well as chemically purified, deaerated water; instead of decentralized, centralized ventilation systems will be employed, as well as cooling units with large unit output, etc.

The Uzbek SSR, Moldavian SSR and Armenian SSR Ministries of the Meat and Dairy Industry have achieved good results on conservation of fuel, heat and electricity.

The Riga production association "Kholod," the Sumy meat kombinat, Baku meat kombinat and the Zerayskiy plant of feather and down items have become winners of the all-union monthly inspection to prepare the branch enterprises for work in the fall-winter period of 1979-1980.

However, the measures adopted to guarantee the efficient consumption of energy resources have not yielded the expected results.

In 1979 the enterprises and organizations of the USSR Ministry of the Meat and Dairy Industry system were given the task of reducing the consumption norms to the planned norms of the previous year for boiler and furnace fuel, and heat by 1%, and for electricity by 1.1%. In addition, the consumption of fuel and energy resources should be reduced by 3% as compared to the norms approved in 1979.

The assignments for conservation of fuel and energy have not been fulfilled. On the whole for the USSR Ministry of the Meat and Dairy Industry overconsumption of heat and electricity has been permitted. They have used 101,000 T of conventional fuel and 191.5 million kw-h of electricity more than stipulated by the assignment. This would be enough fuel and electricity to operate 12 meat kombinats for a year with output of 100 T of meat processing per shift.

Such a situation can only be partially explained by the nonfulfillment of the plan for manufacture of the products that entailed an increase in the specific consumption of energy resources for heating, ventilation, hot water supply, illumination and treatment works. However, the main reason, as verifications have shown, is that at many enterprises energy resources are consumed uneconomically and wastefully, and there are serious shortcomings in the organizational work, standardization of fuel, heat and electricity consumption. The planned organizational and technical measures have not been completely fulfilled. The level of executive discipline is low, as a result of which 93 enterprises have overconsumed 42,700 T of conventional fuel, 133 enteprises--3331,000 Gcal of heat and 48 enterprises--20 million kw-h of electricity.

Fuel	Assignment to reduce consumption standard as compared to planned standards of 1979	Assignment to save fuel as compared to plan	Total
Boiler-furnace			
thous. T of conventional fuel	105.3	94.3	199.6
%	1.2		
Including, thous. T of conventional fuel			
gas	27.9	25.0	52.9
liquid	34.6	31	65.6
solid	30.4	27.2	57.6
others	12.4	11.1	23.5
Heat			
thous. Gcal	490.8	1300	1790.8
%	1.1		
Electricity			
million kw-h	94.3	130	224.3
%	1.5		

The leaders of certain enterprises underestimate the entire complexity of the formed situation with the fuel and energy balance, and they do not pay proper attention to the importance and need for the strictest saving of heat and energy.

The leaders of the RSFSR Ministry of the Meat and Dairy Industry need to draw serious conclusions; this is the only ministry whose enterprises have permitted overconsumption of heat and electricity.

Large miscalculations are being permitted in the planning of new and the reconstruction of the active enterprises. At times the planning organizations permit luxuries, overestimate the output of the boiler units and other power equipment, and make inefficient architectural and planning solutions. The role of the branch scientific organizations is not sufficient in developing the technological processes and equipment with reduced specific power indices, as well as recommendations for involvement in production of the most important reserves of the energy balance, the secondary energy resources.

It is necessary to consider and eliminate this year the errors and miscalculations of past years.

In 1980, the USSR Ministry of the Meat and Dairy Industry approved the following volumes of saving for fuel and energy resources (see the table).

In order to fulfill the assignments of 1979 a number of organizational and technical measures have been developed. Thus, it has been planned to switch 106 boiler houses to natural gas and liquid fuel, to replace 483 outdated boilers with more modern ones, and to introduce automated devices at 202 boiler units, etc. The effectiveness of these measures is apparent from the following data. Thus, with the transfer of 100 boiler units to advanced forms of fuel 25,000 T of conventional fuel can be saved, and when the heating systems are switched from steam to hot water--about 50 Gcal of heat in calculation for one enterprise. The increased use of condensate only by 1% is equivalent to a reduction in consumption of 8,500 T of conventional fuel.

By means of modernization and replacement of the heat-using equipment with less energy-intensive it is planned to save 73.4 Gcal of heat. As a result of the use of natural cold in winter it is planned to reduce consumption of electricity by 60 million kw-h.

The CPSU Central Committee has stressed many times that the situation requires a significant rise in the level of organizational and political-educational work to develop the creative initiative of the workers and socialist competition for all possible saving of energy resources. This requirement was reflected with especial strength in the decree on operation of the Pavlodar oblast party organization to fulfill the decrees of the CPSU Central Committee to save fuel and energy resources at the enterprises and construction sites.

It is necessary to make more active use of all the resources of organizational and political-mass work to educate the workers in the spirit of a prudent attitude towards the consumption of fuel, heat and electricity. Leaders of the enterprises and organizations should stop underestimating the importance of the questions of saving energy resources.

In accordance with the assignment of the USSR Ministry of the Meat and Dairy Industry it is planned to save in the 11th Five-Year Plan (as compared to the norms of 1975): 280,000 T of conventional fuel, 2.8 million Gcal of heat, and 360 million kw-h of electricity.

To guarantee the fulfillment of this assignment, the Ministries of the Meat and Dairy Industry of the union republics, associations and enterprises must work out measures that provide for the introduction of new technological processes and equipment, as well as further technical re-equipping of the energy industry.

It is necessary for the planning organizations to thoroughly analyze the extant model and reusable plans, to make the appropriate changes in order to improve the efficient use of energy resources.

1980 is the year of the 110th anniversary of the birth of V. I. Lenin, the final year of the 10th Five-Year Plan. To make a worthy contribution to socialist competition in honor of this famous anniversary, to fulfill the planned assignments for all indicators, including for the saving of fuel and energy resources are the tasks of workers in all links of production and the control apparatus of the meat industry.

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FUELS

EKIBASTUZ FUEL, ENERGY COMPLEX: ITS WEALTH, OUTLOOK FOR DEVELOPMENT

Moscow IZVESTIYA in Russian 28 May 80 p 2

[Article by Yu. Grin'ko, V. Kulagin and G. Shipit'ko, special correspondents of IZVESTIYA: "Warehouse of Heat and Light: Ekibastuz, Its Wealth and Outlook for Development"]

[Text] The spaciousness of the Irtysh region steppes is immense.

There are low hills and shallow valleys between them. At times there is not a bush nor a streamlet for tens of kilometers around.

Roasted by the exhausting summer heat, blown through with vicious blizzards, cut by slashing autumn rains, the land of Pavlodar is cold in appearance...

But how generous it is!

Its depths store nickel and lead, gold and silver, cobalt and molybdenum, tungsten and quartz. And of course, the greatest wealth of the kray is the underground coal chains of Ekibastuz, that in places break through the alluvium to the earth's surface.

... This was the calling of the Kazakh ore expert Kasym Pshembayev: "to resolve in a natural way, on which creation diverse substances were used." He found a coal bed 130 kilometers from Pavlodar a little more than a century ago. Folk legends state that near the prospecting pit Pshembayev left two pieces of salt that he found here as markers. The name of the place seems to have derived from this--Ekibastuz, which translated from Kazakh means "two heads of salt."

Devastation and hunger reigned in the country, nevertheless, V. I. Lenin found time to focus a lot of attention on the distant kray. In one of his letters on the possible presentation of concessions to the English industrialist L. Urkart he wrote: "The chief question is Ekibastuz and its importance for the Urals." The Leninist plan GOELRO [State Commission for the Electrification of Russia], in the section "Electrification of West Siberia" stresses: "Of the other coal fields the Ekibastuz mines near Pavlodar have the greatest importance." A special commission went to the Ekibastuz region on Lenin's instructions.

Now we know that the coal supplies here are truly colossal. There is no other field in the world with such a concentration of supplies: on a total territory of 160 square kilometers over 7 billion tons of workable and balance supplies of fuel ready for development are concentrated. Without attempting to decrease the importance of the Karaganda basin we will say that the supplies there are 2 times smaller than in Ekibastuz, they are scattered over an area exceeding 3,000 square kilometers, and the raw material has to be extracted from great depths. In the Pavlodar Irtysh region it is enough to remove a 10-15-meter layer of rock and scoop out the coal, load it and send it to the consumers.

However, years were needed for the country to be able to fully start development of the underground warehouses of heat and light.

In speaking at the 25th CPSU Congress, member of the Politburo of the CPSU Central Committee, First Secretary of the Kazakhstan Communist Party Central Committee D. Kunayev reported to his delegates: "There is a new, fourth coal stokehold in the Soviet country!"

The Ekibastuz miners gave the motherland 60 million tons of fuel in 1979 alone; this is double the extraction in the entire prerevolutionary Russia!

One of the basin's veterans, M. Voznyy, whom the challenge prize was named after, and who annually is given the best crew of excavators in the coal association, recalls:

"We started to develop Ekibastuz with the help of three-cube excavators. But soon larger capacity units began to be used at the open pits. The low power locomotives that hauled the coal from the open pits were replaced with powerful SO [Sergo Ordzhonikidze] locomotives, and they in turn by diesel-electric locomotives. The first "millionaires" appeared, crews of the excavators of F. Mokrosloyev, M. Moser, M. Yevstigneyev. Their number began to increase rapidly after the new stage of technical re-equipping linked to the use of rotary units. It is easy to imagine the paths our further development will take after you have been to the open pit 'Bogatyr''."

The giant crater in the body of the planet, 6 kilometers long, 2 kilometers wide, and 200 meters deep makes a stunning impression. It is hard to get used to the idea that the result of man's creative activity is in front of you, and not the consequence of a geological cataclysm.

Below, on one of the ledges of the open pit the bulk of the ERSHRD-5000 rotary excavator rises. The working arm is huge; the rotary wheel, over 10 meters in diameter, ceaselessly rotates near the coal wall of the face. It rotates down and up, biting into the bed with 16 buckets that are seated around its circumference. The buckets rake coal under themselves, pour it onto the conveyer belt that runs over the cantilever, and loads the fuel onto the railroad platforms.

In a minute the 60-ton dump car is filled to the top. A quarter of an hour passes, and the 15-wagon stock is headed for the coal collection station, and another is hurrying to take its place.

At "Bogatyr'" there are now two ERSHRD-5000's. The potentialities of this offspring of the Novokramatorskiy machine construction plant imeni Lenin are truly giant: in the space of an hour, the 11-man crew of the excavator extracts and loads into cars over 3,000 tons of fuel, the daily extraction of the average mine!

The other equipment that is necessary for open pit work is a match for the rotary aggregates. Thus, high labor productivity (over 3,500 tons of coal for one worker per month--without consideration for the stripping work) and low net cost of the product are guaranteed at "Bogatyr'." The first index is 50 times higher than the average branch, and the second is 20 times higher!

The miners of Ekibastuz extract the cheapest fuel in the country. Today it feeds two dozen power plants of Kazakhstan, the Urals and Siberia with total output of 15 million kilowatts. The power that they generate would be sufficient to supply the needs of the national economy of our motherland in the prewar years.

However, there are important "buts"...

A feature of the coal here is its high ash content, averaging 39%. For a long time the specialists have been searching for effective means of enriching it, without success. Calculations have shown that taking into consideration the physical and chemical properties of the Ekibastuz coal, and the scales of extraction, it is most efficient to use it as a power fuel.

As is known, 80% of the electricity is consumed in the European sector of the country, while 80% of all our energy resources are located to the east of the Ural chain. Each year the scales of fuel movement to the center and to the west increase, and this is understandable--a ton of Donetsk coal costs the power engineers about R 20, and the Ekibastuz is 4 times lower.

But the main consumers of the product of the Ekibastuz miners are hundreds and even thousands of kilometers away. The expenditures for transportation cost the national economy "a pretty penny" as they say. The efficient operation of the railroads is diminished, since a lot of empty rock has to be hauled with the fuel. A lot of coal is lost on the way. It becomes more and more difficult to control the enormous freight traffic; every day Ekibastuz now sends several thousand cars. An escape is seen in reducing to a minimum the path of the fuel from the open pit to the consumer.

In developing the Leninist ideas on electrification of the country, the 25th CPSU Congress indicated: it is necessary to build powerful GRES next to the fuel bases. In 1977 a decision was made to create the Ekibastuz fuel and energy complex, and to build a direct current transmission line with 1,500 kilowatt voltage Ekibastuz-center of the country. This marked the turning point in the fate of the entire region.

The task was set of turning the coal basin into an energy base of the Pavlodar-Ekibastuz territorial production complex, and on this basis to give a new impetus to the further development here of such branches of industry as ferrous and nonferrous metallurgy, machine construction and oil refining. Realization of the planned construction program will become an important link in improving the fuel and energy balance of the country as a whole.

In the next 15 years it remains to construct 4 GRES in the Ekibastuz region and 1 near Lake Balkhash with total output of 20 million kilowatts, 3 plus times more than the Krasnodar GES that today is the world's largest. The resources of the Ekibastuz and its neighboring Meykuben'skiy field with its billion tons of coal will guarantee the continuous operation of the GRES cascade for the entire century! The abundant flow of energy will be transmitted to the central regions of the country on an ultra long transmission line extending 2,500 kilometers that does not have analogs.

A little more than 3 years have passed since that day when the abbreviation ETEK [Ekibastuz Fuel and Energy Complex] was heard. What has been done in this time?

The mine builders have completed construction of the last and ninth phase of the "Bogatyr'" open pit. In bringing its output to 50 million tons of coal per year, they started construction of the "Vostochnyy" open pit. At the enterprises of the railroad transportation a lot of work has been done to reconstruct tracks, and electrification of the Ekibastuz-Tselinograd line has been completed. The eastern exit from the Akbidak station has been put into operation, the active electric locomotive depot is being reconstructed, and production buildings are rising for the large complex of car repair and preparation.

In 1977-1979 219 billion rubles of capital investments were assimilated in the construction of the GRES-1. The housing of the GRES-1 that rose on the shore of Lake Zhengel'da became the result of the labor efforts of many thousands of workers in the trust "Ekibastuzenergostroy." In April, the Komsomol youth brigade from the administration "Ekibastuzenergostroymontazh," winner of the socialist competition at the construction site, received the honored right to engage the main knife switch of the station, and the first power unit of the Ekibastuz GRES-1 began to produce an industrial current. Construction is being completed of the facilities of heat supply, ash-trapping, and exhaust purification systems. The equipment of the second power unit is being installed at full speed. Preparation has begun for construction of GRES-2.

During the years of socialist construction in the USSR extensive experience has been accumulated in implementing major power engineering programs. Nevertheless, ETEK has advanced for scientists, planners, builders and miners such problems that they have previously never encountered. It is a complex engineering task, for example, to implement continuous flow of the coal from the open pit to the GRES, continuous unloading, preliminary crushing, grinding grinding and feeding it to the furnace of the steam generator--for the station will begin to burn over 2,000 tons of fuel per hour. Each second the GRES-1 needs over 100 cubic meters of water; where can it be obtained in the arid steppe? The saline water of Lake Zhengel'da was pumped out, it was washed several times with fresh water from the Irtysh-Karaganda canal, and now it is ready, a reservoir to supply the circulating water in the plant's water-cooling system.

The ash that is formed after coal combustion (mountains of ash!) needs not only to be put somewhere, but in such a way that the opportunities are not lost for using it for industrial purposes; it has been established that it is excellent raw material for producing construction materials. A bold decision was made: to transport the ash on pipes to the neighboring saline lake, converting it into a unique accumulator of valuable raw material. And the USSR Ministry of the Construction Materials Industry is already looking for a site for its experimental and industrial plant of ash brick...

"These are far from the most difficult"small tasks" of ETEK," relates the secretary of the Pavlodar obkom of the Kazakhstan Communist Party M. Makeyev, "The ultra long-range transmission of electricity required the most complicated complex of high-voltage and transformer equipment, and unprecedented laser systems of control and regulation. Dozens of institutes, design organizations of the Ministry of the Electrical Industry, USSR Ministry of Power and Electrification, USSR Academy of Sciences and enterprises participated in their creation. The experimental segment of the line with voltage of 1,150 kilovolts and direct current of 1,500 kilovolts Ekibastuz-center of the country confirmed the high economy of such methods of "transporting"power.

There is more. In 10 years at the open pits of the Ekibastuz and Maykubens'kiy fields it remains to bring the level of coal extraction to 170 million tons; this means a colossal growth in the volumes of stripping work, saturation of the open pits with equipment of the highest productivity in the example of "Bogatyr'," creation of a strong repair base, construction and electrification of many hundreds of kilometers of railroads. The current population of Ekibastuz that numbers 75,000, must increase 3-4-fold; consequently, over a million square meters of housing need to be built.

A detailed analysis of how the program of economic, social development is being realized in the formation of the Ekibastuz fuel and energy complex is the subject of a separat discussion, and we will return to it again.

The state has allocated over 7 billion rubles for the construction of ETEK. This is one of the largest construction projects of the 10th, 11th and 12th Five-Year Plans, and is not inferior in importance to such giants as the Baykal-Amur Main Line and the Kamskiy automobile plant.

...The GOELRO plans were written by the weak flicker of a small electric lamp. V. I. Lenin called for "...achievement by the price of the greatest saving in our state, that every slightest conservation will be preserved for the development of our large machine industry, for the development of electrification..." Today, in the energy galaxy of the country of Soviets one of the brightests stars is being born, the Ekibastuz fuel and energy complex.

9035
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FUELS

LIGHT-WEIGHT STRUCTURAL PARTS FACILITATE MINE CONSTRUCTION

Moscow IZVESTIYA in Russian 15 Jun 80 p 2

[Article by V. Radchenko, head of the kombinat "Mosbassshakhtostroy": "True Landmark"]

[Text] The country's mine builders are doing extensive work. Their outlook is as broad--it remains to assimilate major capital investments, to put new mines, open pits and enrichment plants into operation, and to reconstruct many of the active coal enterprises. The coal basin near Moscow must also grow at rapid rates. Within 10 years, every second currently active mine here will "be extinguished," and in order to provide coal for the thermal power plants of several oblasts in central Russia it is necessary in the immediate years to assimilate R 600 million and to erect several large mines.

The course of construction of the coal enterprises has been examined many times at the board of the USSR Ministry of the Coal Industry. And each time the leaders of the mine construction kombinats that have not fulfilled the plans, explained this primarily by insufficient labor resources.

There is one escape here, namely, to build mines with less forces, in compressed periods. But it is not so easy to do this. The year before last, the kombinat "Mosbasstroy" put into operation two mines with total output of 3.2 million tons of coal per year. To construct the surface facilities of these mines, at each construction site they had to assemble up to 1,500 people. Why so many? Because all the buildings and structures were erected without concrete and brick, and monolithic foundations, reinforced concrete or brick walls, and plastering work were required.

This is how the majority of facilities of the coal industry are planned and built in other basins of the country. In the 10th Five-Year Plan, about a billion rubles were invested in the mine construction organizations, and plants were mainly erected for production of reinforced concrete items and brick.

However, there is another more efficient way. In a number of ministries, the USSR Ministry of Heavy Construction, the USSR Ministry of Power and Electrification, and the USSR Ministry of Installation and Special Construction Work, light structural parts are used.

Last year our kombinat succeeded in erecting 10 buildings made of light-weight structural parts--for the technical inspection of automobiles, bases of mechanization, bases of repair of road construction equipment, frame for a plant of electrical sanitary engineering intermediate parts, and other facilities. Thus, a frame over 2,600 square meters in area was assembled by five installers with the help of one crane in only 2 months! This building did not have to be plastered. To build such a framework in the traditional version, of concrete and brick would have required about a year. Light-weight designs have permitted a reduction in the construction period of almost 5-fold. And number of people needed has been reduced by the same amount.

The engineers of our kombinat have suggested to the Leningrad institute "Giproshakht" that light-weight designs be used in plans for surface buildings of the mine "Berezovskaya" with output of 1.5 million tons of coal per year that is currently being built near Moscow. The planners agreed with us. But the request was only half fulfilled: the auxiliary facilities (and this is 40% of all the surface buildings) were still planned in brick and reinforced concrete.

Of course, it is easier to take a standard plan in the brick and reinforced concrete design off the shelf than to rack your brain on individual plans using light-weight designs. However, this simplicity is too expensive for the builders and the state. The time has come to decisively review the outdated standard projects of all the mine surface buildings. This should be understood by all who participate in construction.

It is true that a number of documents recommend the use of light-weight designs in the construction of surface buildings for new mines. However, they count on obtaining light-weight designs from other ministries that have built special plants for their production. They built them for themselves, for their enterprises, and of course did not have us, the mine builders, in mind. Now the plans for the development of the construction industry for the near future that are to be worked out by the mine construction organizations,to put it mildly, have caused consternation: they do not even provide for the construction of enterprises to manufacture light designs.

Besides the use of light-weight designs, there is yet another large reserve for reducing labor intensity, and this means accelerated mine construction: the block-set method of erecting facilities that is used in the oil and gas industry. The authors of the innovation were awarded the Lenin Prize this year. The essence of the method is that the facilities are assembled of bulk blocks, that are not only made of light-weight structural parts, but are also assembled under plant conditions. The use of the block-set method reduces several times the estimated cost, labor intensity and period of construction. This advanced method must be widely employed in the construction of coal enterprises. The faster the better.

9035
CSO: 1822

FUELS

RECOVERY, UTILIZATION OF METHANE FROM COAL MINES URGED

Moscow IZVESTIYA in Russian 10 Jun 80 p 2

[Article by A. Brizhanev, party head of association "Ukruglegeologiya," candidate of geological and mineralogical sciences, and N. Lisovenko, in-house correspondent of IZVESTIYA: "Is It a Matter of Coal or Methane?"]

[Text] There was an occupation of gas burner in ancient times in the coal mines. Dressed in wet sheepskin, with bound head, a man entered the face when work was not being done there, and burned up the methane with a torch on a pole. Dangerous business. For when methane mixed with air it could produce an explosive gas. But then they did not know of any other method of combatting the methane.

Many decades have passed since then, and the labor of the miner has been radically altered: machines chisel, load and transport the coal. But as before, wherever there is coal, there is methane as well. It is diffused in the coal bed, in the layers of empty rock, and is even dissolved in the mine water. As before, it can bring misfortune to those that violate the safety rules. This is why powerful ventilation systems are built at the modern mines, degasification wells are drilled, and special methods of working beds are used. All of this is done in order to free the miners of methane.

With an increase in the depth of working, the quantity of methane that the miners discharge into the atmosphere through the ventilation shafts and degasification wells is rising more and more and today already comprises a colossal figure, billions of cubic meters.

Is the only means of getting rid of methane to discharge it into the air? By no means.

Methane can be not an enemy but an ally, man's helper. If its concentration exceeds 16% this is good fuel. A thousand cubic meters of gas is equivalent to a ton of anthracite. In Belgium, the FRG, England, Poland, Czechoslovakia and a number of other countries, methane is recovered and used for industrial purposes. In the Donbass there is also certain experience of using the threatening companion of coal for peaceful working purposes. Twenty-five-thirty years ago at certain mines pipes were made to the boiler houses. Methane from the degasification wells went there to the burners.

In the system of the USSR Ministry of the Coal Industry 42 mine boiler houses operated on methane. We note that these are fairly large facilities since they supply heat to the entire technological complex of the mines, and consume from 2000 to 10,000 tons of anthracite per year. But now for some reason the number of "methane" boiler houses has dropped sharply, although the casing-head gas of Donbass alone, taken in an annual calculation, equals a million tons of coal in calorific value. What is a million tons of coal? This is the annual extraction of a mine with output of 3,000 tons daily.

The specialists have computed that as a result of the degasification of 196 mines roughly 3 million cubic meters of methane are discharged daily. The 106 mines of Donbass emit into the atmosphere 2 million cubic meters of gas per day. But this is one-fourth of the gas demand for communal-general needs of such an oblast as the Donetskaya.

In the Donetsk-Makeyevka region the coal-bearing layer up to depth 1,200 meters contains more than 50 billion cubic meters of hydrocarbon gases. This corresponds to a gas field of average size. The geologists assert that it is possible (and necessary) to speak of the Donbass as a gas and coal basin. Thus, apparently, one can also evaluate the Karaganda, and the Kuznetsk and the Pechora basins.

The decisions of the party congresses stress the urgent need for the complex use of mineral resources in the country. However, the USSR Ministry of the Coal Industry has never planned, has not considered, and has not used the extraction of casing-head gas. Even those boiler houses that burn methane, reduce its consumption a great deal in the warm season of the year, discharging the surplus into the atmosphere. But this is conditioned gas with a methane content of 35-45% and more.

Today there is a fundamental question as to the preliminary degasification of the coal-bearing layer before it is worked. Even today the geological exploratory enterprises of the Ministry of the Coal Industry can fulfill this task, but the work is being restrained by a shortage of drilling equipment: units of the type UBV-600, A-50, ZIF-1200MR, pumps and drilling tools. The time has come for more extensive purposeful drilling from the surface in the zone of tectonic disorders, there where the methane lies in domal structures, where it is accumulated in natural reservoirs and is under high pressure.

This is not done yet. They hurry to get rid of the gas, even when it is found in large quantities. Thus the gas from the Tomashevskiy domes was thrown to the wind. And there was a lot of it there. Tens of millions of cubic meters escaped through the well alone.

If one defines the main task of the miners for recovery of methane then it is formulated as follows: it is necessary to make broader use of the degasification wells for the greatest possible complete extraction of gas from the coal-bearing layer; to bring to 40-50% the stable content of methane at the exit from the mine; and finally, to see that the extracted stream of gas is not "polluted" by mining air. As a result two of the most important problems will be solved: the miners will obtain a cleaner atmosphere, and the gas will be put to use.

The average coal mine can yield roughly the same amount of methane as the average gas well produces. In addition, in the Donetsk basin there are many geological structures filled with gas, like the Tomashevskiy domes. They are very promising.

Thus, the gas of the Donetsk basin can serve as an important aid to coal and that gas flow that enters from Orenburg, Stavropol' and Central Asia.

In the opinion of the director of the production association "Donetskgaz" N. Tokhtamysh, the mining methane is quite suitable for use.

"Why does it not go to the main networks?" we asked the director.

It seems that methane is distributed without a system, there is no planning in this matter, there are no pipelines and there is no organization that would be centrally involved in this problem. In a word, at the overwhelming majority of mines they do not even think about this.

It appears that it is time to be seriously engaged in a scientific and technical discussion of the problem. Now only the Donetsk polytechnical institute is more or less successively studying questions of burning mine methane in a mixture with natural gas in the boiler houses. This is clearly not enough. It is necessary that such large institutes as DonUGI [Donetsk Scientific Research Coal Institute], MakNII [Makeyevka Scientific Research Institute for Work Safety in the Mining Industry], A. S. Skochinskiy Mining Institute, VNIIgaz [All-Union Scientific Research Institute of Natural Gases], and others formulate standard documents, the most efficient plans of degasification, special technologies, and create the instruments and apparatus for the new branch.

Of course, the USSR Ministry of the Coal Industry alone cannot lift the "methane block," interested participation is needed of the Ministry of the Gas Industry, USSR Ministry of Ferrous Metallurgy, Ministry of Instrument Making, Automation Equipment and Control Systems, Gosplan and Gosstroy. Methane, this casing-head gas of the coal basin, must be used in the country's national economy.

9035
CSO: 1822

PLANT SUPPLIES GAS PIPELINE FITTINGS

Moscow IZVESTIYA in Russian 4 Jun 80 p 1

[Article by I. Kalashnikov: "For Gas Arteries"]

> [Text] The Aleksin plant of heavy industrial fittings in the Tul'skaya oblast is making a weighty contribution to the creation of main gas pipelines of large diameters.

The powerful gas arteries that feed fuel and valuable chemical raw material to the country's most important industrial centers stretched many thousands of kilometers, over steppes, deserts and swamps. The gas pipeline is not only pipes, but complicated fittings with whose help the streams of blue fuel are controlled.

At the plant experimental test stand, built in a row, giant ball cranes are rising, each weighing 45 tons. In order to crate up only one of them a container is needed that is the size of a railroad car. Powerful hydraulic pumps hum that inject high pressure water into the units. The arrow of the manometer slowly creeps over the scale. Now it has passed the 70 atmospheres mark, 100, and finally, it stops at the number 120. The new cranes are tested under such pressure for strength, hermetic sealing and reliability.

"Our plant," says the chief engineer V. Kirilin, "is the sole supplier of such devices in the country. They are designed for gas mains that reach almost 1.5 meters in diameter. The new items are rated for higher pressure in the gas main. And their main advantage is their high reliability of operation. At the command of the dispatcher who is far away, the crane automatically covers the line. There is yet another feature: they are equipped with a special device that automatically disengages the gas pipeline in case of emergency.

The collective has worked for many years towards this labor victory. It provided fittings for the first domestic gas pipelines Saratov-Moscow and Stavropol'-Moscow. Now the extractors of the blue treasures are working in the hot deserts of Central Asia, in Siberia and the arctic latitudes. In order to pump enormous amounts of gas to the center of the country, powerful pipelines are needed, and consequently, larger fittings. This forced the plant specialists on a further search that they made jointly with the researchers of the branch central design office of fittings construction.

They had to overcome many difficulties in developing new items.

"It was necessary," relates the chief production engineer of the plant L. Potrekhalkin,"first of all, to set up treatment of large spherical surfaces. Simply, to learn how to make spheres 2 meters in diameter, and with micron accuracy. We had to spend a lot of effort and labor to finish and polish the parts."

At the plant they reconstructed, constructed a large multispan shop, and introduced advanced technological processes. All of this created the basis for series manufacture of the new products.

Builders of several gas mains have already received the ball cranes. Recently, a large batch of items was sent to the route of the gas pipeline Urengoy-Chelyabinsk.

9035
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GAS PIPELINE FOR SUPPLY TO UZBEK POWER STATION

Moscow PRAVDA in Russian 16 Apr 80 p 2

[Article by F. Ovechkin, Associate of the newspaper PRAVDA VOSTOKA in the Uzbek SSR: "Gas Will Turn The Turbines"]

[Text] Our nation now plans to lay down thousands of kilometers of various types of pipelines. Among the three most important of these will be the gas pipeline which will extend from Shurtan to the Syrdar'ya GRES. Its significance for the expansion of the fuel-power base of Uzbekistan will be a very great one. Facing its builders is this complex task: that of completing the installation of the gas pipeline within a period of 18 months. The construction collectives, however, in keeping with the appeal to achieve higher productivity in this year which marks the 110th anniversary of the birth of V.I. Lenin, have deemed it realistic to complete and to turn over the installation by 7 October. During these April days, the construction workers are working with dispatch on the various sectors of the gas pipeline.

The need for so high a tempo in the construction work is to provide one of the largest electric power station of Uzbekistan--the Syrdar'ya GRES--with an uninterrupted supply of fuel as quickly as possible. Right now, the station is using mazut, the supply of which does not satisfy the requirements of the power workers. That is why, last year, only four out of the station's eight turbines were in operation. The efficiency of its utilization capacity was only 47.7 percent. The cost of its electric power jumped to .7 kopecks per kilowatt hour, which is almost double that of the average cost. In view of the fact that two new turbines were to be placed into operation this year, the decision was made to convert the power station to gas as quickly as possible.

It is the prognosis of specialists that construction of the 400-km gas pipeline which will unite the Shurtan Gas Field in the Karshinskiy Steppes with Syrdar'ya will be of economic benefit to us. The estimate cost of construction--109 million rubles--is high. But this expenditure will be recouped within 4 years. Every day, more than 17 million cubic meters of this blue fuel will be transported along the pipeline. The profit from its sale will exceed 25 million rubles per year. The very greatest benefit, however, will be the fact that, because of this, the Syrdar'ya GRES will be able to operate at long last at full capacity. This means that hundred of enterprises will be able to increase their production once they have eluded the grip of a power shortage.

The construction workers are well aware of the significance of the gas pipeline. That is why they are working with the greatest effort possible. The work tempo increases from month to month. For example, the February plan was fulfilled by 105 percent, while that for March was fulfilled by 110 percent. Since the beginning of construction, over 35 million rubles in capital investment funds have been spent. Welding work has been completed on on-third of the gas pipeline; this included pipe insulation and laying it down in trenches.

It must be stated here that the path of the pipeline carries it through heavily-populated areas, areas not convenient for the construction workers. Pipeline workers must cross over a multitude of canals and drainage systems plus a considerable number of highways and railroads. Almost 70 percent of such obstacles fell to the lot of that section of the line which is being laid down by the "Sredazneftegazstroy" Trust. Despite those difficulties, however, it was precisely that collective of workers which is ahead in the socialist competition.

The uniqueness of the Shurtan-Syrdar'ya GRES Gas Pipeline lies in the fact that it will be the first gas pipeline of such length in the nation over which will flow not the usual pure or clean gas but low-sulfur gas. This will cause a number of technological complications in the installation and adjustment of the pipe. However, workers of the "Sredazneftegazstroy" Trust are managing to cope with them successfully. This is the result of the great deal of experience which was accumulated by workers of that trust in the construction of the most difficult pipe lines in Tyumenskaya Oblast, in the Urals, and in the Karakum Mountains.

9643
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FUELS

ROAD CONSTRUCTION FOR TYUMEN' OIL WORKERS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Jun 70 p 1

[Article "Roads to the Riches of the North"]

[Text] The drill rigs of Tyumen' oil workers have worked their way up into the Northern fields located dozens and hundreds of kilometers from their bases in cities and settlements. These remote fields are the ones which will provide the basic increase in the extraction of oil and gas over the next few years. But in order to get to those new locations and to deliver equipment and machinery to them--this is not a very easy task. Even in winter, in weather which is 50 degrees below zero, the insidious local marshes do not always freeze up and it is not every cargo that can be moved along temporary log roads. With the onset of Spring, the only form of transport possible is by air. This is why, at the present time, there is no more important a project in our program for the accelerated development of the West Siberian Oil and Gas Region than that of the construction or roads.

How are things going with the road builders? What is the situation regarding roads out to the oil fields today? This was the subject of a conversation between our special correspondent V. Noskov and Hero of Socialist labor R. Bulgakov, who is chief ot the Main Administration for Petroleum and Gas for the Tyumen' Region.

"We now have 1,700 kilometers of roads in operation," states Rishad Timirgaliyevich, "roads whose surfaces are made out of reinforced concrete slabs. That is quite a large number. However, less than one-half of 35 sites being worked have a reliable transport connection out to them. Our plans for this year call for the extension of major roads out to yet another six drilling sites. But even with the fulfillment of this plan, the Severo-Pokurskoye and the Lokosovskoye sites will have no roads out to them--work on them is now in its fifth year. A similar situation exists at all of the sites of the Uray Group, as well as at the Van-Yeganskoye, Ur'yevskoye, Tagrinskoye, Mayskoye, Non-Yeganskoye, and Tyumen' sites.

"The laying out of roads within an oil field area is particularly lagging. I do not know why, but it has become the practice to run a road to the drilling site only. Yet other areas on which drilling is being conducted extend for several dozens of kilometers. How are materials and equipment to be transported within these areas? Even on such well-known and long-exploited drilling sites as the Samotlorskoye, the Fedorovskoye, and the Mamontovskoye there are no roads with hard surfaces. The unpaved roads are unreliable. They do not always facilitate the passage of trucks with cargo. Completely absent at 29 sites are major roads within the oil field area. We need to lay down 122 kilometers of roads in just this year alone for the effective operation of wells at sites presently being exploited. Yet roadbuilders have only included 45 kilometers in their plan for this year."

"What have the roadbuilders accomplished since the beginning of this year?"

"Unfortunately, our general contractor, the Main Administration for Road Construction in West Siberia, has done very little to make us happy. Over the past 4 months, the "NizhneVartovskdorstroy" and the "Tyumendorstroy" trusts have not fulfilled more than 2 million rubles' worth of the planned work volume. We are particularly worried about the road which links the railroad station at Kogolymskaya with the Povkhovskoye Oil Field. The road extends for more than 55 kilometers. On only 8 kilometers of that distance has the road bed been laid down. Subunits of the Main Administration of Bridge Construction have begun work in 12 of 22 bridges. The road itself is to be placed into operation this year."

"What, in your opinion, is the reason behind the unsatisfactory work of the roadbuilders?"

"In our opinion, the reason is simple: the leaders of the Main Administration for Road Construction in West Siberia are devoting little attention to the expansion of their subunits. Over the past 2 years, for example, the work volume of the oil workers has doubled. Their material-technical base has, as a consequence, become stronger and more powerful. Plans for the roadbuilders have increased also, yet they are receiving almost the same amount of equipment and machinery that was being supplied to them 2 years ago. Right now, they are already lacking about 300 dumptrucks for successful work organization; there is a large deficit also in the amount of slabs used for road surfaces."

"Rishad Timirgaliyevich, what advances in road construction in the West Siberian Region are being planned?"

"We are placing great hope in such advancements. Construction subunits from a number of union republics and oblasts are being drawn into the work of laying roads in areas where oil is being extracted. They will come bearing their own equipment and will provide reinforced concrete slabs for road surfaces. Without any doubt, such aid will accelerate work progress. Over the next 4 years, construction of over 1,600 kilometers of roads is being planned, i.e., almost one and one-half times more than were placed into operation during the entire time that the mineral wealth of Tyumenskaya Oblast has been extracted. This will permit us to facilitate reliable transport links with a majority of the oil fields presently in exploitation. Thanks to this, there will be a significant degree of acceleration in the work of oil drilling, construction, and oil extraction enterprises which are engaged in the supplementation of the oil field area.

"In order to carry out the strenuous program of USSR Ministry of Transport Construction contract organizations and of the roadbuilding collectives being called upon to work together with oil-extraction associations (which will act the role of customers), it is necessary to carry out a great volume of preparatory work in this year alone. Basically, this work involves a clear-cut organization of the acceptance, unloading and storage of cargoes being delivered from union republics, the construction of advance-pioneer bases, and the housing of incoming construction subunits. Without any doubt, the joint efforts of local construction workers together with that of construction workers from other cities and republics will assist us in creating a reliable network of roads in the oil and gas-bearing region."

9643
CSO: 1822

BRIEFS

NEW OIL WELL--Nukus (Karakalpaksaya ASSR)--The long search of the geologists of the Karakalpakskaya oil and gas exploration expedition ended successfully. The first oil gusher was hit on the search platform of West Barsakel'mes. The well proved to be a gusher, and the oil flow is light, without admixtures of sulfur. In the opinion of the geologists this well is only the surplus of the the boundary for a large and promising area whose center is located under the saline swamp of Barsakel'mes. Now the next well has been placed 10 kilometers from the active one. The silent, desert plateau of Ustyurt has begun to open up its underground storehouses. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Jun 80 p 1] 9035

OIL EQUIPMENT--Kazan'--A powerful air pump that is capable of injecting especially high pressure is being manufactured at the Kazan' compressor plant. This machine, the first in the family of similar units, is designed for oil workers. The compressor is to send an eddy of natural gas along pipes to the deep deposits. Supplies of previously inaccessible fields of "black gold" can be taken from the earth by this method. Seventeen items of the plant have been awarded the state Sign of Quality. The air coolers occupy a special place among them. They are being sent to all corners of the country, and the domestic fishing fleet is equipped with them. [Text] [Moscow IZVESTIYA in Russian 1 Jun 80 p 1] 9035

FORGE COAL--Lesozavodsk, Primorskiy kray--We work in the railroad car depot in the Ruzhino station of the Far East railroad. We are blacksmiths by profession. We decided to write to the newspaper about a situation that is interfering with our normal work. The fact is that for the third year our railroad depot does not have forge coal. We warm up the iron with what we have, even firewood and coal that they stoke the boilers with. There is little sense in this, the quality of work is low, and we produce half of what we could. In our depot we repair closed cars. This is serious work. But what kind of forge work can be done if we do not have the necessary coal, and rather often there is no merchant iron. It seems to us that the railroad administration must have a very responsible attitude towards this matter. And if they cannot supply us with forge coal, then they need to think about such forges that would operate on gas or liquid fuel. In any case, our work must not suffer. [Text] [Moscow IZVESTIYA in Russian 11 Jun 80 p 3] 9035

CSO: 1822

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